PROCEEDINGS

OF THE

AMERICAN SOCIETY

OF

CIVIL ENGINEERS

(INSTITUTED 1852)

VOL. XLI—No. 4

APRIL, 1915

Edited by the Secretary, under the direction of the Committee on Publications.

CONTENTS

NEW YORK 1915

American Society of Civil Engineers

OFFICERS FOR 1915

President, CHARLES D. MARX

Vice-Presidents

Term expires January, 1916:	*Term expires January, 1917:*
CHARLES F. LOWETH	DANIEL BONTECOU
GARDNER S. WILLIAMS	CLEMENS HERSCHEL

Secretary, CHARLES WARREN HUNT

Treasurer, LINCOLN BUSH

Directors

Term expires January, 1916:	*Term expires January, 1917:*	*Term expires January, 1918:*
JAMES H. EDWARDS	GEORGE W. FULLER	JOHN V. DAVIES
HENRY W. HODGE	ARTHUR S. TUTTLE	GEORGE A. HARWOOD
LEONARD METCALF	CHARLES H. KEEFER	J. E. GREINER
HENRY R. LEONARD	MORTIMER E. COOLEY	JOHN F. COLEMAN
EDWARD H. CONNOR	EUGENE E. HASKELL	JOHN B. HAWLEY
SAMUEL H. HEDGES	RICHARD MONTFORT	HERBERT S. CROCKER

Assistant Secretary, T. J. McMINN

Standing Committees

(THE PRESIDENT OF THE SOCIETY IS *ex officio* MEMBER OF ALL COMMITTEES)

On Finance:	*On Publications:*	*On Library:*
HENRY W. HODGE	JAMES H. EDWARDS	GEORGE A. HARWOOD
CLEMENS HERSCHEL	ARTHUR S. TUTTLE	JOHN V. DAVIES
GEORGE W. FULLER	J. E. GREINER	HERBERT S. CROCKER
LEONARD METCALF	HENRY R. LEONARD	M. E. COOLEY
JOHN F. COLEMAN	GARDNER S. WILLIAMS	CHAS. WARREN HUNT

Special Committees

ON CONCRETE AND REINFORCED CONCRETE: Joseph R. Worcester, J. E. Greiner, W. K. Hatt, Olaf Hoff, Richard L. Humphrey, Robert W. Lesley, Emil Swensson, A. N. Talbot.

ON ENGINEERING EDUCATION: Desmond FitzGerald, Onward Bates, D. W. Mead.

ON STEEL COLUMNS AND STRUTS: Austin L. Bowman, James H. Edwards, Charles F. Loweth, Rudolph P. Miller, Ralph Modjeski, Frank C. Osborn, George H. Pegram, Lewis D. Rights, George F. Swain, Emil Swensson, Joseph R. Worcester.

ON MATERIALS FOR ROAD CONSTRUCTION: W. W. Crosby, A. W. Dean, H. K. Bishop, A. H. Blanchard, George W. Tillson, Nelson P. Lewis, Charles J. Tilden.

ON VALUATION OF PUBLIC UTILITIES: Frederic P. Stearns, Charles S. Churchill, Leonard Metcalf, William G. Raymond, Henry E. Riggs, Jonathan P. Snow, William J. Wilgus.

TO INVESTIGATE CONDITIONS OF EMPLOYMENT OF, AND COMPENSATION OF, CIVIL ENGINEERS: Nelson P. Lewis, S. L. F. Deyo, Dugald C. Jackson, William V. Judson, George W. Tillson, C. F. Loweth, John A. Bensel.

TO CODIFY PRESENT PRACTICE ON THE BEARING VALUE OF SOILS FOR FOUNDATIONS, ETC.: Robert A. Cummings, Edwin Duryea, Jr., James C. Meem, Walter J. Douglas, Samuel T. Wagner.

ON A NATIONAL WATER LAW: F. H. Newell, George G. Anderson, Charles W. Comstock, Clemens Herschel, W. C. Hoad, Robert E. Horton, John H. Lewis, Charles D. Marx, Gardner S. Williams.

ON FLOODS AND FLOOD PREVENTION: C. McD. Townsend, John A. Bensel, T. G. Dabney, C. E. Grunsky, Morris Knowles, J. B. Lippincott, Daniel W. Mead, John A. Ockerson, Arthur T. Safford, Charles Saville, F. L. Sellew.

TO REPORT ON STRESSES IN RAILROAD TRACK: A. N. Talbot, A. S. Baldwin, J. B. Berry, G. H. Bremner, John Brunner, W. J. Burton, Charles S. Churchill, W. C. Cushing, Robert W. Hunt, George W. Kittredge, Paul M. LaBach, C. G. E. Larsson, William McNab, G. J. Ray, Albert F. Reichmann, F. E. Turneaure, J. E. Willoughby.

The House of the Society is open from 9 A. M. to 10 P. M. every day, except Sundays, Fourth of July, Thanksgiving Day, and Christmas Day.

HOUSE OF THE SOCIETY—220 WEST FIFTY-SEVENTH STREET, NEW YORK.

TELEPHONE NUMBER.....1446 Circle.
CABLE ADDRESS.....“Ceas, New York.”

Vol. XLI. APRIL, 1915. No. 4.

AMERICAN SOCIETY OF CIVIL ENGINEERS

INSTITUTED 1852

PROCEEDINGS

SOCIETY AFFAIRS

CONTENTS

MINUTES OF MEETINGS OF THE SOCIETY

March 17th, 1915.—The meeting was called to order at 8.30 P. M.; Director Arthur S. Tuttle in the chair; Chas. Warren Hunt, Secretary; and present, also, about 275 members and guests.

The Chairman announced that it had been arranged that this meeting be devoted to a general discussion of certain matters which it was intended to bring to the attention of the Constitutional Convention of the State of New York, to be convened April 15th, 1915; that the Board of Direction had appointed Messrs. Arthur S. Tuttle, Henry W. Hodge, and Alfred D. Flinn, to represent this Society at that Convention; that the Committee so formed had prepared certain suggestions; and that members of this Society, and of the American Society of Mechanical Engineers, the American Institute of Mining Engineers, and the American Institute of Electrical Engineers, had been invited to attend this meeting and take part in the discussion.

The Chairman further announced that the discussion was to be informal, and simply to enable the Committee to get the benefit of the opinion of engineers as to what changes in the Constitution of the State of New York would be advisable and expedient.

The general suggestion of the Committee was that it seemed desirable that the State Constitution, when amended, should insure:

"(*a*) A short ballot, thereby permitting close scrutiny of the qualifications of each candidate.

"(*b*) The selection of a professional head of a Department by appointment instead of election by popular vote.

"(*c*) An uninterrupted term of office for capable Bureau Heads, in order that an efficient government may be maintained.

"(*d*) The application of the Civil Service principle of selection for fitness to positions of major responsibility.

"(*e*) Giving the Chief Executive freedom in selecting his cabinet advisers, and placing upon him full responsibility for such selections."

A number of detailed suggestions concerning the office of the State Engineer and Surveyor; the appointment of Engineers; of a Department of Public Works, and a Department of Public Utilities, were presented by the Committee as subjects for discussion, and these suggestions were read by the Secretary, who also presented communications on the subject from Messrs. Clemens Herschel and Gano Dunn. A general discussion followed, which was participated in by Messrs. A. D. Flinn, William B. Landreth, T. Kennard Thomson, A. B. Fry, N. P. Lewis, E. W. Stern, H. Lichtenstein, T. Hugh Boorman, Henry B. Seaman, Ralph D. Mershon, T. H. Barnes, Oscar Lowinson, H. S. Harding, C. E. Conover, R. C. Kellogg, E. L. Corthell, B. H. Wait, J. H. Granbery, Kenneth Allen, F. W. Skinner, C. M. Hansen, B. C. Collier, E. J. Mehren, F. V. Henshaw, Chas. Warren Hunt, J. P. Carlin, O. H. Landreth, E. G. Carey, Allen Hazen, W. McClellan, R. S. Buck, S. C. Thompson, W. Goldsmith, G. R. Tuska, Bernt Berger, Henry W. Hodge, Lazarus White, and J. P. W. Richmond.

The Secretary announced the following deaths:

CHAPMAN LOVE JOHNSON, of Casanova, Va., elected Member, October 7th, 1903; died March 11th, 1915.

WILLIAM EDWIN MOORE, of Spokane, Wash., elected Member, February 7th, 1906; died January 24th, 1915.

WILLIAM GARDNER RUSSELL, of Altura, Tex., elected Member, October 4th, 1905; died March 5th, 1915.

Adjourned 11.20 P. M.

April 7th, 1915.—The meeting was called to order at 8.30 P. M.; Director George W. Fuller in the chair; T. J. McMinn, Assistant Secretary, acting as Secretary; and present, also, 196 members and 39 guests.

The minutes of the meetings of February 17th and March 3d, 1915, were approved as printed in *Proceedings* for March, 1915.

A paper entitled "The St. John Levee and Drainage District of Missouri", by R. M. Strohl, Jun. Am. Soc. C. E., was presented by title, and discussions by Messrs. Vernon M. Eager and J. S. Spiker were read by the Assistant Secretary.

T. L. Condron, M. Am. Soc. C. E., addressed the meeting on "The Effects of Fire on the Reinforced Concrete Buildings of the Edison Plant at West Orange, N. J., and the Methods of Making Repairs", illustrating his remarks with lantern slides. The subject was discussed by Messrs. H. I. Moyer, J. P. J. Williams, W. J. Barney, E. W. Stern, Carleton Greene, and T. L. Condron.

A vote of thanks was tendered to Mr. Condron for his very interesting address.

The Assistant Secretary announced the election of the following candidates on April 7th, 1915:

As Members

Reginald Sydney Courtney, New York City
Francis Hewette Davis, San Francisco, Cal.
Edgar Raymond Frisby, Manila, Philippine Islands
Thomas Nixon Gilmore, New York City
Harry Andrew Hageman, Boston, Mass.
Robert Lacy, Baltimore, Md.
Ferdinand Joseph Litter, New York City
Phillips Bathurst Motley, Montreal, Que., Canada
Seth Augustine Moulton, Portland, Me.
George Harvey Norton, Buffalo, N. Y.
Zenas Newton Vaughn, Boise, Idaho
Frederick William Whiteside, Denver, Colo.

As Associate Members

Albert Hilands Acher, Balboa Heights, Canal Zone, Panama
Elmer Ellsworth Adams, Seattle, Wash.
James C Bell, Schenectady, N. Y.
Charles Benham, Jr., Rochester, N. Y.
Hjalmar Luther Blomshield, Trenton, Mich.
Clifford Holmes Boardman, Oakland, Cal.
Allen Roy Boudinot, Davenport, Iowa
Richard Brunel, Portland, Me.
Louis Schumann Bruner, Montreal, Que., Canada
Percy Hiram Budd, Phœnix, N. Y.
Robert Lee Burney, San Antonio, Tex.
Robert Campbell, Detroit, Mich.
Clifford Earl Chase, Brewster, Wash.
Charles Henry Covey, Montreal, Que., Canada

George Dave Curtis, Tallahassee, Fla.
Thomas Charles Desmond, New York City
Joseph Alfred Elliott, Wheatland, Wyo.
Frederic Butterfield Faitoute, New York City
Joseph John Greene, Sydney, Australia
James Birney Griffin, Venice, Cal.
Arthur Lines Harris, Monte Christi, Dominican Republic
Elmer Perkins Haw, Ancon, Canal Zone, Panama
Samuel Darlington Heed, New York City
Whitney Clark Huntington, Boulder, Colo.
Ralph Hutchins, Baltimore, Md.
Clarence Cecil Jacob, Phœnix, Ariz.
Cleveland Abbe James, Buffalo, N. Y.
Robert Waterman Jones, McMinnville, Ore.
Warren Winfield Kelly, Los Angeles, Cal.
Frederick Evoy Kneip, Washington, D. C.
Gerald Wilson Knight, Lakewood, Ohio
Jean Howard Knox, Oakland, Cal.
Louis Dietrich Koop, New York City
Clyde Emerson Learned, Oswego, N. Y.
Clifford Stone Leet, Pittsburgh, Pa.
Albert Richard Losh, Manhattan, Kans.
Lee Orlo Murphy, Reno, Nev.
Ray Stevens Quick, Pittsburgh, Pa.
Frank Oliver Ray, Denver, Colo.
Lawrence Dunlap Sheppard, Keokuk, Iowa
James Raymond Stack, Duluth, Minn.
Norman Merritt Stineman, Chicago, Ill.
Nathan Henry Sturdy, Youngstown, Ohio
Frank Henry Villie, South Bethlehem, Pa.
Willis Dow Peck Warren, Decatur, Ill.
Ernest Clifford Willard, Seattle, Wash.

As Juniors

Dumont Beerbower, Washington, D. C.
Pablo Tomás Beola, Manati, Cuba
John Wolfram Berkefeld, Piedmont, Cal.
Donald Hilary Connolly, Fort Sam Houston, Tex.
Elwin Harold Findlay, Bridgeport, Conn.
Arthur Sidney Hallberg, Manila, Philippine Islands
Fred Dailey Hartford, Denver, Colo.
Henry Jalmar Heinonen, New York City
Frank Helm, La Junta, Colo.
George McIntyre Holroyd, Albany, N. Y.
Charles Henry Elliott Holstlaw, West Palm Beach, Fla.
David Howe Lucchesi, Jr., Baltimore, Md.

Walter Scott Obermeyer, Pittsburgh, Pa.
Norris Dunham Pease, West Hartford, Conn.
Clarence Paulding Rhynus, Washington, D. C.
Joseph Joslin Strachan, Savannah, Ga.
Carlos Nicolás Todd, Havana, Cuba
George Boynton Watson, Grand Mere, Que., Canada
Roy Allert White, Louisville, Ky.
Ralph Edward Whitney, Lynn, Mass.

The Assistant Secretary announced the transfer of the following candidates on April 7th, 1915:

From Junior to Associate Member

Paul Bailey, Tracy, Cal.
Harold Affleck Brainerd, Westfield, N. J.
Lynn Crandall, Salt Lake City, Utah
Royal William Davenport, Washington, D. C.
Marcus Martin Farley, New York City
John George Hirsch, Milwaukee, Wis.
Arthur Caswell King, Springfield, Mass.
Jabez Curry Nelson, New York City
Albert Fredrick Porzelius, Pittsburgh, Pa.
Earl Querbach, Avalon, Pa.
Richard Francis Roberts, Nutley, N. J.
Shaler Gordon Smith, Rockford, Ill.
David Bernard Steinman, New York City
Otto Jordan Swensson, Yonkers, N. Y.
Gordon Saxton Thompson, Troy, N. Y.
George Lansing Wentworth, Yonkers, N. Y.

The Assistant Secretary announced the following deaths:

Foster Crowell, of New York City, elected Member, December 1st, 1880; died March 29th, 1915.

Francis Henry Hambleton, of Baltimore, Md., elected Member, March 5th, 1873; died March 19th, 1915.

William Hunter, of Philadelphia, Pa., elected Member, June 5th, 1895; died April 2d, 1915.

Walter Ashfield McFarland, of Washington, D. C., elected Member, May 3d, 1910; died March 17th, 1915.

Henry Gurney Morris, of Philadelphia, Pa., elected Member, December 4th, 1867; date of death unknown.

Isaac Rich, of Somerville, Mass., elected Member, May 6th, 1903; died March 11th, 1915.

Adjourned.

REPORT IN FULL OF THE MEETINGS OF THE PRESIDENTS OF LOCAL ASSOCIATIONS OF MEMBERS, AMERICAN SOCIETY OF CIVIL ENGINEERS.

A meeting of the Presidents of Local Associations of Members of the American Society of Civil Engineers was held at the Society house at 10.30 A. M., January 19th, 1915, upon the invitation of the Board of Direction.

Present: A. M. Hunt, President, San Francisco Association; E. F. Vincent, President, Colorado Association; J. L. Hall, Delegate, Seattle Association; John B. Hawley, President, Texas Association; W. B. Gregory, Vice-President, Louisiana Association; F. W. Cappelen, President, Northwestern Association; U. B. Hough, President, Spokane Association; F. G. Jonah, Vice-President, St. Louis Association; C. T. Leeds, President, Southern California Association; Willard Beahan, President, Cleveland Association; Leonard Lundgren, Representative, Portland, Ore., Association; J. E. Greiner, President, Baltimore Association; Park A. Dallis, President, Atlanta Association; Richard L. Humphrey, President, Philadelphia Association.

Also present: Hunter McDonald, President, Am. Soc. C. E., and a Committee of the Board of Direction appointed by resolution to attend this meeting, consisting of J. A. Ockerson, M. T. Endicott, Past-Presidents, and Charles Warren Hunt, Secretary.

On motion, duly seconded, Richard L. Humphrey was elected Chairman.

THE CHAIRMAN.—I might say just a word in acknowledgment of the compliment you have paid me. I think these local associations can be made a very important factor in the work of the Society, and I certainly feel highly honored that I should be selected, at this preliminary meeting, to act as Chairman.

Perhaps it would be best to start by having our Secretary outline briefly the general scope of this meeting. I understand that a committee of the Board of Direction is to meet with us, and I think the Secretary might explain the purposes of this meeting, and then we can take up the work to be done.

CHARLES WARREN HUNT, SECRETARY, AM. SOC. C. E.—Mr. Chairman and Gentlemen, in the first place, the Committee of the Board consists of Messrs. Ockerson, Endicott, and Swain, and the Secretary. The Committee was not appointed to interfere with the business of this meeting, but it was thought that it might be helpful to the Presidents of the local associations to have some members of the Board present during their deliberations.

As to the question of the work of this meeting, I think no one knows just what should be done. These associations are widely scattered, and different as regards their make-up and as to local condi-

tions. Some of them are in large and flourishing cities, and some are in smaller places, and the Board of Direction does not know the ideas of the members of these various associations in respect to their relation to the Society. It has never had a chance to find out, and this meeting has been called so that there might be a general discussion of the conditions that obtain and the needs of the local associations, with a view to outlining the things which it is wise and proper for such associations to undertake, local or otherwise; how far their powers should go, and any question which might come up as to the relations of the associations; further than that, nothing has been talked of, except in a very general way. It was thought that if the representatives of these associations could get together, much good might result by outlining a general plan for uniformity of action in their work.

JOHN A. OCKERSON, PAST-PRESIDENT, AM. SOC. C. E.*—Mr. Secretary, could you give us the total number of members in the fourteen associations?

MR. CHARLES WARREN HUNT.—I could not; I should think the San Francisco Association is the largest of them.

A. M. HUNT, M. AM. SOC. C. E.—188.

MR. CHARLES WARREN HUNT.—And Seattle, Portland, and Spokane —there are about 100 members in those associations.

J. L. HALL, M. AM. SOC. C. E.—About 80 in Seattle.

U. B. HOUGH, M. AM. SOC. C. E.—There are 30 in Spokane.

W. B. GREGORY, M. AM. SOC. C. E.—35 in New Orleans.

JOHN B. HAWLEY, M. AM. SOC. C. E.—68 in Texas.

MR. CHARLES WARREN HUNT.—You take in the whole State?

MR. HAWLEY.—Yes. In the State Association we have 142 on the list, and 68 are members of the association.

MR. CHARLES WARREN HUNT.—Why can't we call the roll?

THE CHAIRMAN.—I suggest that we elect a Secretary, and following that, that each representative shall state the number of members in his section, the territory covered, and the work performed. The Chair will entertain a motion to nominate a Secretary.

A MEMBER.—I nominate Mr. Park A. Dallis, of Atlanta, to be Secretary.

(Motion seconded.)

THE CHAIRMAN.—Any further nominations? Those in favor of Mr. Dallis as Secretary will signify by saying "aye"; contrary minded, "no." It is agreed to.

* On February 11th, 1915, proofs of this Report were forwarded to all who took part in the meetings, with the request that they be corrected and returned promptly. All have been heard from except Mr. Ockerson. The record of his part in the meeting is here printed as taken down by the reporter.—*Secretary.*

Inasmuch as San Francisco was the first association started, Mr. A. M. Hunt might perhaps outline briefly the membership, the territory covered, and the scope of the work performed by the San Francisco Association.

MR. A. M. HUNT.—The San Francisco Association was the first one organized (on April 28th, 1905), and it embraces those members of the Society resident in San Francisco, and, I think, within a radius of 100 miles, although of that I am not positive; the present membership is 188.

We have meetings six times a year, and they are generally held at one of the hotels, preceded by a dinner, with a short intermission, followed by papers, or the presentation of some topic of general or local interest, usually accompanied by lantern slides. The meetings have been very active and profitable. The average attendance during the last year was about 70. Since its organization, the association has imposed local dues of $5, and the fund thus created is used for expenses of meetings, such as for lanterns, etc.; also, the President and Secretary are authorized to invite, as guests of the association, at these dinners and meetings, any visiting members of the Society; and at almost all the meetings we have two, three, or four visiting members.

Quite a little fund has accumulated, and it is our hope that eventually that fund may grow to such a sum that we may use it for some really creditable purposes. I think the San Francisco Association, as well as all others, has felt the need of something definite as to its powers and limitations. The question has frequently come up as to action on matters of general and public interest. We do not know where we stand, except that, in all matters of national or country-wide interest, we feel that the local associations should be very careful as to any action which they may take, which might be considered as committing the Society, and I think something definite should be outlined which would state the limitations as to what we may or may not do, and the reasons for it.

However, whenever matters of wide importance come up and action is taken by the Board of Direction of the parent Society, the local associations should be informed fully and constantly as to that action, and what action seems desirable from the point of view of the Board of Direction, so that the local associations may reinforce and strengthen the influence of the Society at large. It would be fatal—for instance, take one subject which is now active, that of licensing engineers—if the local association in one part of the country should take action which differed from that taken by the parent Society, or by associations in other parts of the country. It would be quoted against us, and would also be quoted as the action of the entire Society. That would be very undesirable.

On the Pacific Coast I think we have as nearly a class of insurgents as anywhere in the country, and although we desire as full and complete local autonomy as we can get, we feel that there are things which we have no right to trench upon.

The local association should be given full power to act on all matters which are of local interest only, or where the action taken by the local association could not be quoted or used in other sections of the country.

Questions have frequently arisen where the association could have helped mould public opinion, and perhaps rendered public service, but we have hesitated to take action—to take steps as an association—because we did not know how it would be regarded by the governing board of the Society. It would be easy to outline general rules which would govern in these matters; and it is one of the most important things for this meeting to consider.

THE CHAIRMAN.—I think we will take the gentlemen in the order in which they sit.

SECRETARY DALLIS.—I would like to ask Mr. Hunt if his association collects dues from the total membership?

MR. A. M. HUNT.—Dues are collected only from members of the association. Any member of the Society who expresses a desire to join may do so, and only those who join as members are assessable for dues.

A MEMBER.—You collect dues from 188 men?

MR. A. M. HUNT.—Yes.

THE CHAIRMAN.—Will you state the territory that you cover?

MR. A. M. HUNT.—I cannot give it off hand.

MR. CHARLES WARREN HUNT.—The State of California.

MR. A. M. HUNT.—The entire State of California?

A MEMBER.—There is a Southern California Association.

MR. A. M. HUNT.—Our title is the San Francisco Association of Members of the American Society of Civil Engineers.

THE CHAIRMAN.—It would be well to take the gentlemen in order: Mr. John B. Hawley, President of the Texas Association. Will you state the number of your members, the dues, if any, the territory you cover, and the scope of your work?

MR. HAWLEY.—We cover the entire State of Texas. The catalogue shows 142 members throughout the State. If we meet them, we remind them that they should be members. Our dues are $3 a year. Our Constitution and by-laws were copied almost exactly from those of the San Francisco Association, only a few details being changed. We meet twice a year, in May and November, at some point in Texas. The first meeting was held on November 13th, 1913, in Dallas, and about 35 or 40 members attended. We organized and had a few discussions—no formal papers—and a dinner, and left to the Board of Directors the matter of locating the next meeting.

The next meeting was held at Austin, under the auspices, you might say, of the State University. At that meeting several papers were read, and the Secretary had them printed. They were corrected by the authors, and printed in a small volume of *Proceedings*. The Directors located the first annual meeting at Houston, Tex., where there was an attendance of about 65, and several papers. Our *Proceedings* are not yet printed. I tried to get them printed so that I might bring them with me.

The *Proceedings* will be of the standard size and the papers are revised by the Board of Directors before they are presented. We had several quite creditable papers. Our next annual meeting will be in San Antonio. These meetings have been in South Texas, because the majority of our membership is south of the central line, and east of the central meridian of the State. In May or the latter part of April we meet, at the time of a fête held there, usually in the latter part of April.

The next meeting will be in Fort Worth. We are distributed over 300 000 sq. miles of territory, but we aim to make of the social feature quite an element. Some of us have been in Texas for 20 years. I have been a member and located at Fort Worth more than 20 years, and yet I do not think I have met all the members in that section.

The matter of getting together and becoming better acquainted is of importance; but we are not overlooking the matter of getting more and more a set of scholarly papers presented to the meetings. We have very good engineers among our members, and there is no reason why we could not get them to write papers, and print them in our own *Proceedings,* and send them to the Society for filing, and that will be done.

THE CHAIRMAN.—The next gentleman, Mr. Gregory.

MR. GREGORY.—I am Vice-President of the Louisiana Association, at New Orleans. The President of the Association, Major Frank M. Kerr, found it impossible to come to this meeting, and therefore asked me to represent him. Our association has about 35 members, of all grades, and the total membership of the Society in Louisiana is between 55 and 65. Not all the members, therefore, have come into our local association. We organized as a result of the meeting of the American Society of Civil Engineers, held in New Orleans, in October, 1913.

The active work of the association has only begun during the last few months. Last Wednesday night we had a meeting which was followed by a dinner, the annual banquet, and at that time we discussed a paper which I am sure you will all remember, one by Maurice G. Parsons, Jun. Am. Soc. C. E., entitled "The Philosophy of Engineering".

The meeting was quite well attended, and very much enjoyed. We had had one meeting, three months previous to that time. We have only four meetings a year. The reason is that the Louisiana Engineering Society was organized in 1898, and was a strong, going concern before the local association of the American Society of Civil Engineers was organized, and the Louisiana Engineering Society embraces mechanical, electrical, and all other lines of engineering, and covers a wider field. Practically every member of the local association is also a member of the Louisiana Engineering Society, and we have felt that whatever we do must be done so that we will not interfere with the workings of the latter society.

I came here without any instructions, merely to listen and to learn, and to aid in any way possible in any movement that will lead to the betterment of local societies, or of the American Society of Civil Engineers, and add any interest to the work.

THE CHAIRMAN.—The next gentleman.

F. W. CAPPELEN, M. AM. SOC. C. E.—The Northwestern Association was organized in the fall of 1914. We have had two meetings. I do not know how many members we have, because we take in North and South Dakota, Minnesota, and part of Wisconsin, and the Upper Peninsula. Our Secretary has been corresponding with various members, but I really do not know how many we have, but we have had two meetings with about 40 members present, mostly from the greater cities, some from South Dakota, and also members from Michigan. We adopted practically the San Francisco Constitution. Our dues are $2.

There is one thing that I might mention. Minnesota belongs to the tail end of Geographical District No. 3, which takes in New York State, and we have very little chance for representation. We would like the possibility of changing the district, to get away from the tail end of New York State. We are so far away, and, of course, we have absolutely nothing to say in the affairs of the district. If we could make a change in that line, we would like it very much.

MR. OCKERSON.—Why don't you make New York the tail end of your district?

MR. CAPPELEN.—Maybe we can; I had not thought of that. The meetings have been very well attended, and I believe it is a very good move. I am here to learn and listen.

MR. CHARLES WARREN HUNT.—I would like to ask why it was that you took in so much territory, and whether it was thought that people would come to meetings from Montana and other outlying points, and that there would be a possibility of their really belonging to the local association.

MR. CAPPELEN.—The matter was taken up by correspondence, and by committee.

MR. CHARLES WARREN HUNT.—And the people out there really wanted it?

MR. CAPPELEN.—Yes, sir.

MR. CHARLES WARREN HUNT.—I think that is a good point.

MR. CAPPELEN.—We have the Twin Cities as headquarters, and meet at the Engineering Building of the University of Minnesota, Minneapolis, where we have splendid facilities, an assembly hall as large as the Auditorium of the Society House, and good facilities for consultation. We have a caterer, and have dinner served in that hall as well as you could get it in a first-class restaurant. We open our meetings with a dinner, and have a couple of hours of discussion of some subject.

MR. CHARLES WARREN HUNT.—My object in asking was to bring out the idea that some of these associations have confined themselves to State lines, but yours has not, because there are a lot of outlying people in it who are not in touch with any particular community, and not as much in touch with things in general as those who live in the smaller cities, and it might be proper for this meeting to consider the enlargement of the lines of the various districts, so as to take in the membership which is not represented, in order that, as far as possible, every member of the Society could belong to a local organization.

MR. CAPPELEN.—We have a member from the copper country, one from Marquette, and one from Pierre, S. Dak. They have been present twice, coming on quite long trips. We made a special effort to get these gentlemen to come to us, because we believed that most of these engineers would be glad to meet the Twin City engineers, and join this association. We have taken in the new banking district, what do you call it?

MR. CHARLES WARREN HUNT.—The Federal Reserve.

MR. CAPPELEN.—Yes, we take in the territory of the Ninth District of the Federal Regional Bank.

MR. OCKERSON.—There is an amendment up now that will change these districts.

MR. CHARLES WARREN HUNT.—Yes, I did not mean districts, but there are many members who are in the outlying country, and it would be very advantageous if they could be attached to one of these local associations.

THE CHAIRMAN.—Mr. Cappelen referred to the fact that his association is in the same district as New York State, although it is away off in the western part of the country. There is an amendment pending that will make thirteen districts.

MR. CAPPELEN.—You know Minnesota belongs to the New York district.

MR. CHARLES WARREN HUNT.—Yes, that is the weakness of the present system. It is certainly the intention of the Board of Direc-

tion in proposing this amendment to the Constitution to provide six more districts, and that will enable the territory to be divided in such a manner that there would be at least one, and possibly more associations in each district, so that every member of the Society would have the privilege of joining one of these local associations.

MR. CAPPELEN.—We feel that we should get a little better representation on the Nominating Committees, and so forth. Generally, it is this way in Minnesota: We get a letter from some candidate, saying, "will you help us", and some time after we get another from somebody else. We have nothing to say; we do not know anything about it. We are so far away that we have really no interest whatever, nor any influence.

MR. CHARLES WARREN HUNT.—You are not much worse off than some of the other districts. You see, Seattle and Denver are in the same district, and Texas, I think, is in the same district as Washington, D. C.

MR. CAPPELEN.—We belong to New York State, you see.

THE CHAIRMAN.—Mr. Hough.

MR. HOUGH.—I am the President of the Spokane Association. Our membership is 30; I believe that is what the Secretary and I counted the other day. For some little time it was around 25, but some new members have come in lately, and the work now in progress by the various railroads will make our membership more, and our association, I think, larger. Our dues are $2, and we meet every 60 days. We usually have a paper, or at least a discussion, on some engineering subject. Our association is rather small, but we felt that there was certain work that we ought to do, we did not know whether we ought to take it up through the American Society or not. The result was that we have just organized, and gotten into working shape, a General Engineering Society. We organized the local branch of the American Society of Civil Engineers about three years ago. However, I was not in the State at the time. A great deal of my work is outside the State, and I am absent much of the time, but we feel that we ought to do a great deal of work that is now being done by other people. In other words, the engineers of Washington are not getting through the State what they are entitled to, so we have organized a General Engineering Society to take up that work, as we thought we could do better in that way. We have a membership of 150 or 200 in the new organization. That covers the Electricals, the Mechanicals, and the Civils; it takes in the Architects, and I think the Chemists. I know we intended to cover all those branches. We are taking up the Water Code of the State, in fact, the American Society of Civil Engineers took it up two years ago. Another matter we are taking up, through the Society, is the road work in the State, which is being done by politicians. We feel that the engineers ought

to get in on this. The idea of organizing this new society was to get after this work, but we did not know whether we ought to do all these things as members of the American Society of Civil Engineers or not.

I hope that the work of this Society will be enlarged. There is a Society of Civil Engineers at Seattle, I believe it is Northwest or Northwestern——

MR. CHARLES WARREN HUNT.—The Pacific Northwest Society.

MR. HOUGH.—That is it. They tried very hard to start a Pacific Northwest Society of C. E. in Spokane about three years ago, but we felt that we wanted some kind of a yard-stick to measure up the members which we did not believe this society had; so we got together and organized the Local Association of the American Society. The Electric Society was organized at the same time, and both of them, though small, are in a very flourishing condition.

SECRETARY DALLIS.—I want to know what the total membership of this Engineering Society is.

MR. HOUGH.—Thirty, I said.

SECRETARY DALLIS.—That is the Association; how many are there in the Spokane Engineering Society?

MR. HOUGH.—The other Society?

SECRETARY DALLIS.—Yes.

MR. HOUGH.—200.

F. G. JONAH, M. AM. SOC. C. E.—I am Second Vice-President of the St. Louis Association. The President of that Association, Mr. Ockerson, is present, and can tell you more about it than I can.

MR. OCKERSON.—As President of the Association, I appointed myself delegate to this meeting, but President McDonald informed me that that would not answer the purpose, that I would not be recognized as a delegate; so I appointed Mr. Jonah, who, I assumed, would tell all about our association. The members of the St. Louis Society of Civil Engineers have held out for a long time against any formal association, because St. Louis has an active Engineers' Club, and has had for 40 years or more, and the members did not feel that they could afford to do anything that would interfere with the efficiency of their club. They, however, had an informal association which met at irregular intervals. Whenever anything of importance in connection with this Society came up, a meeting would be called by the President, and those matters discussed, and some action determined upon; but beyond that we had no regular affiliation with the parent Society. The St. Louis Engineers' Club, within the last two years, has adopted a different scheme, and now we have an Associated Engineering Society, the Engineers' Club being at the bottom of it. Each brings in the members of all the other societies, and makes really a very active organization, and very effective, the Electricals, the Mechanicals, and the Mining

and Contracting Engineers, and all have a certain interest in the proceedings of the Engineers' Club.

During the past year the members of the American Society of Civil Engineers concluded to organize more formally, and adopted a Constitution which was submitted to and approved by the Board of Direction of this Society. We have no definite meeting dates, except that two meetings a year are called. Still, whenever there is anything of importance relating to the welfare of the Society, a meeting is called for the consideration of such subjects as come up.

We have participated with the Engineers' Club; two meetings a year are assigned to the American Society of Civil Engineers, and members of the Society are expected to provide the papers, and a member of the local association presides at these meetings.

We have on our list, I think, about 180 members. However, there are only about 65 who are paying members at the present time. Our dues are fixed at $2 a year. I think that about covers the ground. We feel that the association can do a great deal of good in the way of sustaining the Society, and can increase its scope of usefulness and influence by taking some assertive action in public matters in which the Society should participate.

Some of our members feel that they ought to have the same privileges as members of the other societies, the members of the Mechanical Engineers, for instance, and they ought to be allowed a certain sum per member on account of being members of the local association. There is quite a difference of opinion in regard to that, however, and I think most of the members feel that the dues paid to the Society are fully compensated by the value of the membership and the *Proceedings* and matters of that kind. I have paid dues for 35 years, and I can say that I think it is the best investment that I have ever made.

MR. CHARLES WARREN HUNT.—Colonel Ockerson therefore does not have to pay dues any more.

MR. OCKERSON.—Then, Mr. Secretary, I cannot get any rebate. I do not know that there is anything that I can add. As I say, we are tied up with the Local Engineers' Club to such an extent that we do not feel that we ought to do anything that will interfere with its activities. We have concluded to take in a radius of 200 miles from St. Louis. That is, we do not want to trench on Chicago and take in their members—that would not be fair—or on Kansas City, on the other side, and other cities not far away. So we have limited our activities to a radius of 200 miles from St. Louis.

THE CHAIRMAN.—Did you say that the members of the Society voluntarily become members of the association?

MR. OCKERSON.—Yes.

MR. CHARLES WARREN HUNT.—There are about 65 paying members.

THE CHAIRMAN.—Yes; but they are not members until they subscribe.

MR. OCKERSON.—We hold them as members for the time being, but we have to contribute to the Engineers' Club in proportion to our paying members. Consequently, although our circulars are sent to all, we limit our active members to those who pay, because we are obliged to pay the Engineers' Club a certain sum per member.

C. T. LEEDS, M. AM. SOC. C. E.—The San Francisco Association covers the territory of the Southern California Association, but the members in Southern California felt that the distance to San Francisco was so great that there was need of an association there. There has been for some years in Los Angeles what is known as the Engineers' and Architects' Association, which has been quite a useful association, and includes engineers of all branches, and also architects, but there was a feeling among a good many men, that, if we had a local association, as members of the American Society of Civil Engineers, there was a great field for us. So our association was formed in the fall of 1913, with a charter membership of 85. Since then we have added eight members, and there remain approximately 50 members of the American Society of Civil Engineers who have not yet joined, but whom we are trying to persuade to do so.

MR. CHARLES WARREN HUNT.—What is the limiting line on the north of your territory?

MR. LEEDS.—I am not certain whether it is stated in the Constitution or not, but I think it is the topographical division.

MR. CHARLES WARREN HUNT.—I did not know whether it was or not.

MR. LEEDS.—Yes, I think it is that. We copied our Constitution directly from the San Francisco Constitution, making the membership dues $3 instead of $5, and holding our meetings bi-monthly.

We have had a very good attendance at each of the meetings, where, as is customary, we have a dinner, and a paper afterward. Another activity which we have, which we think will serve greatly, is that of holding informal weekly lunches, simply of the men whom we can get together informally at some convenient restaurant—no papers, but simply to come together for social intercourse, and to discuss matters of engineering interest.

There are two matters in particular which we are agitating at the present time, in the endeavor to make the stand of engineers higher, one in particular, on expert testimony. I am not familiar enough with the laws in the East, to know much about the situation here, but out there it is a fact that certain engineers have acquired the reputation of being professional experts; in other words, their services are available to the party who is willing to pay them the highest. Fortunately, the doctors have in their field much the same conditions, so that there has

been, or is to be, introduced at this session of the State Legislature a bill which will require that an expert, either a doctor or an engineer, shall be appointed by the Court, and shall simply testify as to facts, and in that way his testimony will not be salable.

Another matter which has been taken up is the need of more data as to rainfall and snowfall in the mountains. Doubtless, Mr. Hunt, of the San Francisco Association, has had experience of this kind, which I think is general throughout the Pacific Coast, in investigating questions of power installations, and matters of that sort.

In Los Angeles, in connection with flood control, there is an astonishing lack of information at the rainfall stations, where there should be much. A report was presented by Mr. Binckley and Mr. Lee, before one of the meetings of our association, and has been forwarded to the Board of Direction for revision and possible publication.

MR. CHARLES WARREN HUNT.—I would say, Mr. Chairman, that this report is endorsed by the Southern California Association, has been accepted, and will be published as soon as possible.

MR. LEEDS.—I am very glad to hear it.

MR. CHARLES WARREN HUNT.—The Board accepted it on the statement that it had been endorsed by the Southern California Association; it is going out as such; the Southern California Association is accepting responsibility as to all the statements made.

MR. LEEDS.—The association is perfectly willing to do that.

MR. CHARLES WARREN HUNT.—That was the feeling of the Board, that if any association sends in any paper and stands sponsor for it, it is proper for the Society to publish it.

MR. LEEDS.—We do not want to commit the Society in any way.

Another matter which has been discussed very informally by us is that of the admission of members to the parent Society. I suppose it is common throughout the country, but we have run across it particularly out there. A man wants to join the Society, and he will either approach a member personally, or write to him, and ask if he has any objection to putting his name down as an endorser. It is rather a delicate thing to turn a man down, and at the same time if one is not careful about it, the name goes down, and the impression goes out to the other members that that name has been endorsed; so that we would suggest that wherever an application is made, regardless of the endorsements which may be received from individuals, a letter be addressed to the local association requesting its Board of Direction, or a committee which it might appoint, or a vote of the entire association, whichever might be deemed best, as to their recommendation regarding the admission of the applicant and the grade to which he is eligible.

If it is found best, the parent Society need not delegate any power, the local association may not be given power to blackball a certain man, or to guarantee his admission; but it should give additional light to

the Board of Direction, and where concerted action of that sort is taken, it certainly should outweigh any other recommendation.

MR. OCKERSON.—The matter of expert testimony came up among the St. Louis members a few days ago, and it seems to me that if the Engineering Societies can take a hand in a movement of that sort, which will result in eliminating the kind of expert testimony we have, it would be the best thing we could do. I have conferred with a number of the men of the local associations, and they say that they do not seem to be able to reach any conclusion. If it could be taken up at the expert end of the line, we might reach some conclusion.

I once drew a specification for a Board in power, which did not suit the successors of the Board, who were of a different political complexion. It was suggested to me that the next time I drew a specification I should have it mean the same thing to any politician. I found it impossible to do that.

This is very important, and if our Society could take the lead in matters of this kind and get some results, it would be very desirable.

MR. LEEDS.—Then there is a question of privilege. In a case that arose very recently, one of our members was in Court as an expert, and had rendered a report. The other side learned of it, and nothing could prevent that report from being brought into evidence. It is inadmissible to make the communications of an engineer a privileged matter.

MR. HALL.—I am a delegate from the Seattle Association. Mr. Ernest B. Hussey, the President, was unable to attend, and asked me to come in his stead. On my way here I prepared a little paper which contains some recommendations to submit to this body. I will present them now, or reserve them until later.

THE CHAIRMAN.—Each association should present its views in a general way, and now is as opportune a time as any.

MR. HALL.—(Reading.)

"I desire to offer a few remarks upon the relations between local sections and the parent Society and to suggest some ways in which it is thought a local section may become most useful to the Society, to its own members, and to the community in which it is situated. Incidentally, I will make brief mention of the Seattle Association of members as illustrating one phase of the subject.

"The want for local divisions of the American Society of Civil Engineers is clearly evidenced by the voluntary association of members already formed, and they in a measure automatically supply that want.

"In order that the local sections may become fully effective it is felt that provision for them should be made in the organic law of the Society, and that they should be accorded representation and a voice in its general councils and conventions. Also, the relations should be so adjusted that local sections will tend to embrace the entire membership.

"The surest way to induce every member of this Society to become a member of a local section will be to enable him to do so without extra expense to himself. Such an arrangement is open to the objection that it will deprive the general treasury of a certain amount of revenue which is required to meet the expenses of local sections. Our experience shows, however, that this necessary expense is comparatively small.

"If each local section be authorized to collect from its own members the annual membership dues and remit to the Society, after retaining, say, $2 per member to meet local expenses, then the local section will have a strong incentive to induce all eligible engineers within its territory to become members of the Society. The increased membership that will result from such efforts will, it is thought, do far more than recompense the Society financially.

"The increased power and influence conferred on local sections by the plan suggested will, beyond any doubt, result in a very rapid increase in the number of sections, and it is perhaps reasonable to anticipate that before long the delegation from local sections will become so large and representative that it can with propriety be invested with the function of choosing the Board of Direction and possibly also the general officers of the Society.

"The particular form which activities may take in any local section will naturally depend somewhat on local conditions. In those cities where an opportunity for technical papers and discussions is already provided by another local engineering society of general scope, as is the case in Seattle, the section meetings of the American Society of Civil Engineers may be given over to social intercourse and to subjects relating to the welfare of the parent Society, of its members, and of the Profession at large.

"The Seattle Association, numbering 75 to 80 members, holds monthly meetings at luncheon in the College Club, with a usual attendance of about one-third of its membership. It does not read or discuss technical papers. One subject it has considered is the private practice of engineers while employed as professors in the State University, and their nominal engagement as consultants by State and County officials. For further investigation of this and similar matters, a general committee was appointed, consisting of three members from each of the five or six local engineering societies.

"A similar committee, very recently appointed, is undertaking to devise a plan for the federation of all local engineering and technical societies in Seattle. The hopeful thing about this undertaking is that probably the only feasible way to co-relate these existing organizations is one which will preserve and strengthen the identity of each, thus giving the engineer member the advantages of a large general society locally and at the same time reserving to him the distinction of membership in a more exclusive society of National repute.

"Certain of our members suggested the plan of merging all these other local societies into the American Society of Civil Engineers, but apparently the time for that has long since passed. This was pointed out in President McDonald's Annual Address, wherein, at the close of his description of the German National Engineering Society, he made the following comment:

"'I have dwelt at considerable length on the abstract of this article because it shows what might have been accomplished in this country had the management of our Society shown the same interest in the Profession at large as it has in the welfare of its members only.'

"The Seattle Association has given some study to the Address just mentioned, and while our members are in favor of maintaining the present high standard of membership in the American Society, they are also heartily in accord with President McDonald's conception of enlarging the membership of the Society.

"Although the Society must presumably, for the most part, remain aloof from joint action with outside engineers, there appears to be no reason why Local Associations of the Society should not be federated with other local engineering bodies, to the end that the Profession may have a fuller recognition in each community. Such federation will tend to render any one unfavorably conspicuous who continues to practice engineering without associating himself with such a federation of his Profession.

"If there is any well-defined desire for a lower grade of membership than we now have in this Society, that want might more appropriately be supplied by the local federation than by altering our own requirements. The local federation can have such grades of membership as it chooses, but members of the American Society of Civil Engineers, when participating in meetings of such federation, will be recognized as members of the American Society of Civil Engineers, thus reserving to themselves and to their Society whatever of prestige that designation may imply.

"On behalf of the Seattle Association of Members and its President, whom I have the honor to represent, I am instructed to urge your favorable action upon the following recommendations:

"1.—That a committee be appointed to draw up, tentatively, such articles as may be required to provide for the formation of local sections of the American Society of Civil Engineers, and for representatives of those sections to attend and have voice at the Annual Meetings and Conventions.

"2.—That the articles be so drawn as to encourage the local discussion of matters relating to the advancement of the Profession at large, and the general betterment of the members of the Society, rather than exclusively to meetings devoted to technical papers and their discussion.

"3.—That social acquaintance and personal interest among the members of the Society be strongly encouraged.

"4.—That the committee also consider increasing the membership by the methods suggested by President McDonald in his Annual Address at the last Convention.

"5.—It is suggested that the committee be instructed to draw up the said articles and send copies thereof to the Presidents of the existing Local Associations of Members within three months after this Annual Meeting, with the request that the tentative articles be discussed by the Local Associations, and a summary of the views and arguments as well as recommendations, returned to the committee within the next three months. That, again, within the next three months, the committee revise the preliminary articles and send a copy of the revised articles together with a brief summary of the arguments

for and against, to the corporate membership, and arrange for submitting the adoption of the articles to the next Annual Meeting."

THE CHAIRMAN.—Mr. Endicott, do you want to speak for the Washington Association?

M. T. ENDICOTT, PAST-PRESIDENT, AM. SOC. C. E.—If there is nobody here from Washington, I would be glad to say a word. I am a member of the Washington Association. This is a somewhat different organization from the others. It is chiefly social, and it is composed of most of the members of the Society of that city. The dues are $1. It has one meeting a year, which is in the form of a conversazione and a banquet, and the members discuss Society matters in which they are commonly interested; but ours is not a formal organization, such as the others.

That was mooted several years ago. Then there was growing up what is called the Washington Society of Civil Engineers, which is now out of its swaddling clothes, and is a very useful and vigorous society, and that includes the great majority of the members of the American Society of Civil Engineers living in Washington, so that the matter of making ours a more formal organization has been mooted with us, believing that our local association might interfere somewhat with the growth and usefulness of the Washington Society of Civil Engineers. That condition no longer exists, and I think it possible a more formal organization may some time be effected.

THE CHAIRMAN.—The next gentleman.

WILLARD BEAHAN, M. AM. SOC. C. E.—I am President of the Cleveland Association. We have been organized but 30 days. I have come down under instructions to spy out the land and see what was to be expected. We have 45 members. We understand that our territory is limited to Eastern Ohio. Of course, we must not encroach on the territory of Cincinnati. In that territory, as we interpret it, there are 88 members of the American Society of Civil Engineers. We would expect that undoubtedly 75 of the 88 would enter our association. Our dues are $1 a year.

What we have especially in mind is, what our attitude should be toward the Cleveland Engineering Society. That has been answered partly by Mr. Ockerson, and by Mr. Gregory. We have in Cleveland the Cleveland Engineering Society, a society 35 years old, with 750 members, embracing, of course, not only the civil engineers, but the mechanical, electrical, and chemical engineers—we have no mining engineers—and architects. I think it is the most healthy engineering association in this country. I do not think you will find its equal anywhere. The members of the American Society of Civil Engineers, who are also members of that, felt that we should do nothing to duplicate the work, or to hamper the work of our Cleveland association. We would not like to do that; and one of the questions for

which I was to endeavor to find an answer was, what should be our attitude, as members of the American Society of Civil Engineers, toward the Cleveland Society which, of course, is a general society.

We meet every month, and irregularly, about every week, because we have papers for the electrical engineers, papers for the architects, papers for the mechanical engineers, and for the chemical engineers. Although our monthly meetings are general, we have smokers and banquets, and if there is anything that we do not have in Cleveland, it is something that I have not heard of.

I am not particularly concerned about what we should do locally, because, as President, I am afraid we will attempt to do too much. We are very active out there. With regard to legislation along the line of licensing engineers in Ohio, I said to our Committee, merely as a suggestion, that it adopt the policy of President Wilson, "Watchful waiting", and not go too fast.

The Cleveland Association is young, and I have come here to find out what our attitude should be toward the Cleveland Engineering Society, and what the experience of other members has been toward a local society which seems to be filling the whole field of engineering most successfully, and in a way of which we are very proud.

SECRETARY DALLIS.—In that engineering society, do you include architects and mining, electrical, mechanical, and chemical engineers?

MR. BEAHAN.—We include civil, mechanical, electrical, and chemical engineers, and architects; there are no mining engineers there. I do not think we would turn any one out if they would show us they were engineers.

E. F. VINCENT, M. AM. SOC. C. E.—The organization of the Colorado Association was effected about 1908. We now have a membership of about 75, the Secretary not having heard from all the old members at the time that I left. That association includes about 87% of the members of the American Society in the State. Although our name is the Colorado Association, we do not aim to limit the membership entirely to the State; and, in fact, sometimes some of our old members move outside of the lines, and still retain their membership. The annual dues are $2. We hold regular monthly meetings preceded by an informal dinner, and afterward usually have a paper or an address on some technical subject, often with lantern slides, and also have a social evening after that, if we get through in time.

These monthly meetings are ten to the year. We do not have any during July and August. We also have weekly luncheons, which are intended, primarily, as get-together meetings, to get acquainted. An engineering architectural association was formed about 30 years ago, but it failed to attract to it the best of the Profession, and after some 10 or 15 years it died a natural death.

Our members, the members of the American Society, after some years, felt that it would be a good idea to have a local organization which would get us acquainted with each other. We found that some members of the American Society, who had lived pretty close together for some years, were not very well acquainted.

I came without any special instructions, but to look the land over and see what could be done. We have up with us the question of a bill for licensing engineers, and four years ago such a bill was introduced in the State Legislature, but I believe was not reported out of Committee. At that time the local society felt that since it was possible for such a bill to come up, it would be well for us to get in line and get something that we might propose, not that we felt like pushing it, particularly, but in order to direct legislation and give a suggestion as to what we thought would be proper if something of that kind were to be put through.

At our last monthly meeting, a week ago last Saturday evening, a vote was taken of the members present, and ten expressed themselves as in favor of pushing legislation looking toward the licensing of engineers. Four opposed such action and five were non-committal.

THE CHAIRMAN.—Mr. Lundgren.

LEONARD LUNDGREN, ASSOC. M. AM. SOC. C. E.—I am the representative of the Portland Association. The association was organized June 18th, 1913, with 43 members. Prior to this date there was an informal organization of members of the American Society in Portland, meeting a few times a year. The Society now has 60 members, and the dues are $2.50 a year. The officers are: George C. Mason, President; W. S. Turner, First Vice-President; John T. Whistler, Second Vice-President; G. B. Hegardt, Treasurer; Charles McGonigle, Secretary, 815 Chamber of Commerce. Mr. E. G. Hopson is the only Past-President.

We hold a meeting once every two months. It begins with a dinner, after which a paper is read, and then we have a business meeting. Sometimes these papers are of such general interest that we throw the meeting open to outsiders, sending out invitations, and advertising in the newspapers. At times we have large audiences at these lectures. At the last meeting we had a lecture on the Columbia Highway, illustrated by photographs in natural colors, which was one of the most interesting talks I have ever listened to on an engineering subject. The idea is not to be exclusive, but to give whatever good things we have to others as well.

I happen to occupy a somewhat peculiar situation. As an engineer of the United States Government, I have traveled through all the Rocky Mountain and Pacific Coast States during the last two years. During this period I have belonged to the Denver Association, the San Francisco Association, and the Portland Association. My headquarters are now in Portland, but I retain my membership in the

San Francisco Association, because I feel that that Association is going to be under heavy expense this coming year, and because I wish to feel at home when I go there.

There is one feature which is somewhat peculiar to Portland. There is an Oregon Society of Engineers, which is firmly established, and has a large membership of men, who do not join the National bodies. On the other hand, there are men in the local associations who, like myself, are traveling around so constantly that they do not care to join the local organizations of engineers. That seems to have been worked out very happily in Portland, as the members of the National engineering societies are accorded all the privileges of belonging to the local society except voting.

The Oregon Society of Engineers has broken away from some of the dry paths engineers are apt to travel, and instead of having talks by engineers, they will not permit a member of their society to give a talk at these weekly meetings. They get men from outside to talk to them. The speaker, being a non-technical man, attempts as well as he can to educate us engineers in problems with which we are not intimately connected, and also attempts to show in what way we can help in these other activities. For instance, I attended one meeting at which a member of the Board of Education spoke on the educational problems of Portland and of Oregon, and then he appealed to us to assist the Board of Education in their various plans. I just cite that as one instance, to illustrate a very unique programme which is being followed by that society.

I have listened to the talks of the other members with a great deal of interest. During my membership, I have followed the creation of these associations. I would deplore it a great deal if the local associations became too active in the workings of the parent Society. If the 13-district amendment is adopted, I feel that we will have all the voice that we are entitled to in the working of the Society. I do not think it is for the benefit of this Society to add more officers for the working out of its problems. I am more or less of an *insurrecto,* and think that our Board of Direction can move a little bit faster, but I do not think that by adding to the number of officers, we can help in any way whatsoever, and I do not think that the local associations should take money from the parent Society. We can meet our own expenses and need no financial assistance. The parent Society is making a good return for the money, as I see it. The Board of Direction is far better equipped to handle the financial end of the Society than we are, and I do not think that we should drain its resources for our own local associations.

J. E. GREINER, M. AM. SOC. C. E.—I am President of the Baltimore Association, which has been organized about 8 months. It is open to all members of the American Society in Maryland. It has one annual

meeting, and as many others as may be called by the Board of Directors, and the dues are $3 per year. Its object, of course, is primarily to take an active interest in the business and work of the parent Society, and secondly, a social interest, a personal interest in members, the local members themselves. The association is too young to have done anything so far, but we felt at the start that it would be a good thing for the guidance of future local organizations if the parent Society should outline a Constitution, and let that Constitution be uniform for all associations.

SECRETARY DALLIS.—About how many members have you?

MR. GREINER.—We have about 80 members. I think there are about 120 or 130 in Maryland.

THE CHAIRMAN.—Mr. Greiner, do the members of the Society volunteer to become members of the association? That is, do they write to you to become members?

MR. GREINER.—Any member of the American Society of Civil Engineers may become a member of the local association by sending in an application, provided he is accepted by the Board of Directors.

MR. OCKERSON.—It seems to me there is an important field of usefulness for the local associations in connection with the conditions which cover the entire country. I am a member of the Special Committee on "Floods and Flood Prevention and Allied Subjects"—whatever that may mean—and I think it numbers fourteen, Mr. Secretary, does it not?

MR. CHARLES WARREN HUNT.—Yes.

MR. OCKERSON.—We have attempted to hold meetings. At the last meeting three members were present, and we have had great difficulty in getting any results from a great majority of the members.

The remark made by the Los Angeles representative suggested to me that that might be a good subject for the local associations to take up—rainfall and run-off, and matters of that kind—which are important features in the work of this committee. If things of that kind could be taken up by the local associations, by tentative committees, with the general committee of the Society, they could give a local atmosphere to matters of that kind that a committee not thus appointed probably could not. I want to call attention to that, as it might be a very important field of work for the local associations.

MR. CHARLES WARREN HUNT.—I would like to say to Mr. Ockerson that it seems to me that the proper way to bring about the result which he desires would be by communications addressed to the local associations by the Special Committee, specifically outlining the points raised and the information desired, because I am sure that all the local associations would be glad to respond and give it; but let the initiative come from the Special Committee.

THE CHAIRMAN.—The gentleman who just came in——

MR. CHARLES WARREN HUNT.—Is Mr. H. S. Crocker, Vice-President of the Colorado Association. I asked him to come in.

PARK A. DALLIS, M. AM. SOC. C. E.—First, I would say that the Atlanta Association was organized in 1912. It was a case of necessity, for the American Association for the Advancement of Science was coming to Atlanta, and it was rather a big proposition for the technical men of the city, numbering 152, to handle. Of all the engineering societies, there was at that time a chapter of the Electrical Engineers, the Architects, the Engineering Association of the South, and the American Chemical Society. The members of this Society met and organized the Atlanta Association. About 6 months later, the members of the Mechanical Engineers met and organized the Atlanta Section of the Mechanical Engineers.

We have 24 members of the Society, of all grades, in Atlanta, and 56 in the State. We worked under the old Constitution up to the last meeting in January, and at that meeting we drafted a new Constitution, which has not yet received the approval of the Board of Direction. The first Constitution eliminated all politics in the association, and we found that, without a little politics, we got very little work.

The oldest member was automatically Chairman of the association, and at the last meeting, a President of the association was elected, and I come as President under the new Constitution, and as representative under the old.

We have a very small number of technical men in Georgia; in fact, of the six organizations, there are only 205 members in the State, and we have formed with those an affiliated technical society, in which the identity of any branch organization is not lost, or affected by the by-laws and Constitutions of any of the other societies. It is really an affiliation, at which we have barbecues every year. We are working under a number of difficulties at Atlanta; some of the points have been brought out.

One of the points that strikes me very forcibly is as to what should be required of an expert witness. As one of the societies to which I belong deems it improper for an expert witness to answer a hypothetical question, I appealed twice to the Judge—in a recent case—before answering the hypothetical question, and asked him for the right not to answer any hypothetical question for or against my client, but was forced to answer.

There is a tendency in our section of the country toward the lines of purchasable engineering testimony, which we are finding in all these societies, you might say, in an underhand way. There is a quiet movement with a view of appointing a little later a committee from this affiliated technical society to confer with the city authorities. This committee will be composed of one man from each of the National

organizations, to confer with the city to procure the enactment of laws which will protect the technical men in that section of the country.

We have commenced first with the technical officers in the city. The Engineering Committee of the Chamber of Commerce, which consisted of eight men, six of whom were members of this Society, investigated the city affairs, and found that out of 75 cities of about the size of Atlanta, we alone had a peculiar method of electing our city engineer and chief of construction. As this method was not in accordance with the ideas of the committee, it drew up a report, which was written without any feeling or any fear of opposition, not one of the eight men ever wishing to become chief of construction, or willing to accept it if offered; so that we could draft this report without any fear. It was held up in the Chamber of Commerce, but finally approved. There was at that time a little feeling, which I am very thankful to say has been passed over. But we are needing in our section—and, from the remarks made, I judge that it is the same all over the country—some work on the political end, some committees from this Society and other societies, joint committees, to assist in drawing up rules and regulations, making recommendations to State Legislatures, and also municipal bodies.

What I have said relates to engineering of all classes, and more particularly to civil engineering. We have had a hard time in getting the members to the meetings, have no definite points of membership, as the first organization was made simply for the interests of Atlanta, and we did not feel that we could draw on the State, as we wished, for donations for such meetings.

Now, the Constitution, when approved, will be open. Any member of the American Society, regardless of where he lives, may become a member of the Atlanta Association. The dues are not to exceed $3 for resident members, and $1.50 for non-resident members. This year we have taxed the membership $2. It will require that every member of the Society, who wishes to become a member of the Atlanta Association, shall sign the Constitution and by-laws, deposit it with the Secretary, and pay his dues in advance. One year in arrears will drop him from the rolls of the association.

At a meeting some three Saturdays ago we had ten present, and we discussed this matter. At the last meeting nine members were present, and not knowing what this meeting was for, there was a general conversation as to what would be for the best interests of the association and of our members.

One of the points brought out—and it seemed to be the unanimous opinion of those present—was that a Junior member should have more recognition in the Society than simply being on the rolls. From the fact that other societies have a special pin for Juniors, we would suggest investigation as to whether or not this Society should not have this

special pin for the Juniors. It will put them in a position so that where older members meet them on a train, in our travels, we can make ourselves known. They feel more or less timid in speaking to the older men, and it will bring in the social side of the Society, and encourage the younger men to perfect themselves, and become corporate members of the Society.

Another matter was brought up at that meeting, though possibly it is a little irregular. The members present were heartily in favor of the Society having student branches at different colleges, similar to other organizations, so that the students who, after graduation, are eligible for junior membership, might be familiarized with the workings of the Society. The reading of the *Proceedings* will no doubt do these boys good, and our association would strongly recommend the thorough investigation of the question of student branches.

A MEMBER.—What about that recommendation that you made to the Chamber of Commerce looking to the elimination of politics in the appointment of municipal engineers? It is a thing devoutly to be wished. I would like to hear what you suggest.

SECRETARY DALLIS.—We pointed out the wrong, instead of suggesting the remedy. We showed them what was being done by 75 other cities on the subject, cities having from 125 000 to 250 000 people, which is about the population of Atlanta, and in a number of these my memory is that the chief of construction, the city engineer, is appointed by a commission, that is, employed by a commission. In some cases he is asked to stand the examination of the Government service, and in no case is he elected by popular vote.

A MEMBER.—Do you have an election by popular vote in Atlanta?

SECRETARY DALLIS.—Yes, and that election was repeated just a short time ago by popular vote, and in the drafting of one of the ordinances they put in the words, in the appointment of inspectors, that he "shall be a technical man". The labor unions have combined and have gotten the City Council to strike out those words, and we have to get them in again.

Those little points harass us constantly. They are really nobody's business, unless it is the Association of Civil Engineers, or the affiliated societies, and we are trying to get in behind them and keep out of politics. We are not politicians; we are negative politicians. We are for nobody except the man who is fully qualified to hold the position.

Now, the present Smoke Inspector is a Fellow of the Electrical Engineers, and a member of the Society of Mechanical Engineers, and he holds his position with fear and trembling. Recently they put out Mr. Dan Cary, who had charge of the superintendance of parks, for some political reason. I do not know the details of the matter now, but I do know from hearsay that Mr. Cary had been fulfilling his

duties excellently, and it is quite a regret to know that he is out of his position, not on account of Mr. Cary, but simply from the fact that in these positions we want men fully qualified to carry out the work entrusted to them.

MR. OCKERSON.—As an example, which it may be well for other cities to follow, we secured for Member of the Board of Freeholders who wrote the new Charter for the City of St. Louis, a member of the American Society of Civil Engineers, and when matters relating to engineers were discussed they were referred by that member to the engineers, and we threshed it out and he threshed it out in the Board of Freeholders; and the technical qualifications which appeared in the amended or new charter, are now the same as we have in the Constitution of the American Society of Civil Engineers, which is very satisfactory——

A MEMBER.—That is, for the City of St. Louis?

MR. OCKERSON.—The City of St. Louis; all the engineering boards in the various departments of the city works.

THE CHAIRMAN.—The Chair will say a word about the Philadelphia Association. This association was organized October 17th, 1912, and includes all members of the Society resident in Delaware, and in Pennsylvania east of the Susquehanna River and its northern branch, including the Cities of Wilkes-Barre and Scranton. Its present membership is 112, and there are about 360 members of the Society eligible for membership. Any member of the Society may become a member of the association by signifying this desire in writing to the Secretary and subscribing to the Constitution and By-Laws which have been approved by the Board of Direction of the Society. The dues are $2 per annum. The association meets in January, April, and October of each year. The association has held six meetings, and at the meeting last evening, there were present Professor Charles D. Marx, the President-Elect of the Society, and 125 members and guests.

The question of licensing engineers came up some time ago, a bill having been introduced in the State Legislature and reported out of Committee, placing the licensing of all engineers in the State of Pennsylvania in the hands of the State Highway Commissioner. As a result of protests, a State Commission was authorized for the purpose of considering the matter and making recommendations to the Governor. Our Philadelphia Association then became very active. The matter was discussed by the association, and it unanimously adopted the resolution "that it is the sense of this meeting that it is unnecessary and undesirable to license engineers." A Committee was appointed which submitted a report to the association, and was instructed to present the matter before the State Commission. I am very glad to report that as a result of the activity of the Philadelphia Association, the State Commission has recommended to the Governor that it is undesirable at the

present time to license engineers. The Philadelphia Association has thus demonstrated the value of such associations. If one State should pass a law, licensing engineers, other States would follow, and it is necessary, in order to prevent such legislation, to have some one on the spot at the time the matter is initiated. The local associations of the Society fulfill such a function in a very satisfactory way.

Another matter that has been under discussion, and that I have been authorized by the Philadelphia Association to present before this Conference, is the licensing of architects. Illinois and New Jersey, and some other States have a law licensing architects. In Chicago, I believe the architects have been endeavoring to make it necessary for any one practicing structural engineering, to take out a license as an architect; the resolution passed last evening by the Philadelphia Association was that this Conference should consider the question of appointing a Committee to take up the question of licensing engineers and architects, and if that is not germane to this Conference, that the Society be asked to consider the question of appointing such a Committee.

MR. CHARLES WARREN HUNT.—It has been asked; it has been before the Board of Direction.

THE CHAIRMAN.—We hesitated for a long time in Philadelphia about forming a local association of members of this Society, because most of us were members of the Engineers' Club, and there was a feeling that the formation of such an association would be detrimental to the Engineers' Club. I am happy to be able to say that, instead of being detrimental, it has been highly beneficial. A matter which has developed since this association came into existence is the formation of the Engineers' Society of Philadelphia, an organization composed of the Engineers' Club and the local branch organizations of the National Societies—the members of these societies being affiliated members of the Engineers' Society. This organization covers many of the points that have been here discussed; its by-laws have been very carefully drawn, and provide that where there is an expression of public opinion of any kind, if the Constitution of the parent Society forbids such action, that such expressions or resolutions shall contain a statement to the effect that the affiliated association is debarred from participation by the regulations of the parent Society.

I think that this is a solution of the problems in St. Louis, Cleveland, and a number of other places where the members of this Society affiliate with the members of other societies, to form a strong local engineers' body. We do not lose our identity. Before the Engineers' Society are papers relating to civil, mechanical, electrical, mining, and chemical engineering, and each member has the privilege of attending meetings of other societies. The primary purpose of the Society is to

develop a spirit of sociability and co-operation among all classes of engineers in the community.

I came uninstructed by my association. Our Board of Direction discussed many of the questions which have been presented here, and we were of the opinion that these associations should be made co-ordinate parts of the Society; we feel that an association should bear the same relation to the parent Society that a State bears to the Federal Government; that the time is ripe for the Society to divide the country into sections, each to be known by some appropriate name; that such organizations shall elect their representatives on the Nominating Committee and on the Board of Direction; that they in a way pass on the applications of residents in their territory for admission to the Society; and that they in some way be represented at the Annual Meeting of the Society. In other words, these local associations should be utilized for the purpose of upbuilding the Society and strengthening its influence in the country at large.

MR. CAPPELEN.—I would like to add to my previous remarks, that St. Paul has a society called the Engineers' Society of St. Paul, and Minneapolis has the Engineers' Club of Minneapolis, two flourishing societies; both feel that this meeting will be of benefit to them, and particularly to the younger members in the American Society.

MR. HALL.—I would like to add a word to what I said in reference to the participation of the local associations. I presume it is difficult for some of the engineers near headquarters to realize definitely the feeling that exists in the remote places. I know something about it, as I was five years in New York City before going to Seattle, and those things did not occur to me at all until after I went to Seattle and realized how far away from headquarters I was. We are just as loyal to the Society as we can be, of course. I would not want any other idea to go out; and our only idea is to become more useful to the Society, in fact, and that our members, by closer association locally, may be more influential in the community, and receive more benefit for themselves.

I think that the Engineering Profession is large enough and well enough equipped to make its influence felt in any community, and the only reason that it is not felt is because we are not unified in the community; and I have been pleased to note from the reports given here that that problem is being worked out very much along the lines suggested.

A thing we are undertaking now in Seattle is the federation of the local members of engineering societies so that we can have one large body for a general meeting. When we have that, if a paper is presented by the Chemical Society, notice will be sent to all the engineers of this affiliated society, and those interested may attend. If a structural matter comes up, it will interest the mechanical engineers, and

so on; and I think that if any good is to come from our meeting here, it should be looking toward the solving of some of these general problems, so that our local associations may be definitely tied up to the parent Society.

You will note that what I said about the local associations sharing in the revenues was treated almost in a parenthetical way. We are not caring particularly about that, but the idea is that we have a plan by which every member of the American Society would automatically become a member of the local association. The field for developing a local association is very small, and my idea is that it will more than repay the parent Society by the increased activity and by bringing in engineers who will begin to see that they can get some advantages by being members of the American Society of Civil Engineers.

THE CHAIRMAN.—The Chair has been making notes as you have been talking, and has some seventeen suggestions:

The relation of the associations to the Society;
The support of the associations by the Society;
The powers of the associations;
The matter of each association selecting a member of the Nominating Committee and of the Board of Direction;
The relation to public matters;
The publication of papers;
The power and size of the associations;
Territory covered;
Delegates to the Annual Meeting;
Number of members, minimum and maximum, in each association;
The election of members in the Society;
Expert testimony;
Affiliation with other engineers;
Licensing of engineers and architects;
Co-operation of the associations in the work of the Society;
Student branches;
Junior membership should be given greater recognition.

It seems to me that this meeting cannot, by general discussion, do anything. It is a quarter after twelve. I would suggest that we stay in session until 1 or 1:30, discussing our work generally, but that we appoint a committee of three, perhaps, to draft something, and then adjourn to meet late this afternoon, or preferably at 8 o'clock this evening, at which time the committee will have something tangible to suggest. That is merely put forth as a suggestion. The matter is open for discussion.

MR. LUNDGREN.—Are the delegates empowered to do anything? I know I have not the power. I know there are several other men with

whom I have talked to-day, and it seems that most of us are here to look and listen and to go back and tell what we hear.

THE CHAIRMAN.—The Chair feels that in matters of this kind we do not want too much red tape. The primary purpose of this meeting is to try to make some recommendation to the Board of Direction. We cannot legislate any new laws into the Constitution. That is a matter for the Society and for the Board of Direction, but it seems to me that after all these men have come here to have this discussion, to go back without accomplishing something tangible would not be right. My idea is this, that we recommend something for consideration by the various associations. Let them discuss it, and let it come back again; and in that way we can perhaps crystallize the views of the various associations, and when these are shaped they can be transmitted to the Board for such action as it deems proper.

MR. LUNDGREN.—I think it would be proper for us to get the stenographic notes of what has been said, and each association can talk this matter over and decide if it is desirable to do anything.

THE CHAIRMAN.—Although the Chair does not wish to force things to be done, quite a good deal of criticism is that we do not act. If we adjourn now we will have to meet again. I do not see that any one obligates this Society to be governed by his action, nor does he obligate the Society by putting on record his thoughts.

SECRETARY DALLIS.—Mr. Chairman, I move: First, that you ascertain the best time for us to meet again. I think some of us have engagements at the theatres this evening. Eight o'clock would suit me, and after you decide on the best time for the next meeting, I will move that you read those seventeen memoranda that you have taken, and ask for general discussion on each point, and that you require at least one man present to discuss each item or give us a few words on them, and then later, during this meeting, or at the close of this meeting, that a committee be appointed, sub-divided as you may see fit, a committee or committees to confer with the Board of Direction in a proper method, as to the points brought out by these different associations.

Speaking for Atlanta, although I was not authorized to do anything special here, I feel sure that 98% of our members would be willing and ready to do what these Presidents decide; and I believe that these associations really need some assistance and co-operation with our parent Society.

A MEMBER.—I was going to suggest that we have with us Mr. Hunter McDonald, President of the American Society of Civil Engineers, and that we would all very much like to hear from him.

HUNTER MCDONALD, PRESIDENT, AM. SOC. C. E.—Mr. Chairman, I do not believe it is necessary for me to say anything on the subject. The members know already my sentiments pretty well with regard to

the formation and conduct of local associations. I think the views expressed here to-day refer principally to the matter of affiliation with local societies. I think it is essential that local engineers should arrange some plan of affiliation in order that they may sustain their local organizations, and, in my judgment, the question of what attitude the members of the American Society should bear toward those local organizations is the one that presents the greatest difficulty.

The next question is the extent to which local organizations can affiliate, can participate in local political affairs. I believe that the delegates present here can make valuable suggestions to the Board of Direction, and the Board of Direction would welcome such suggestions.

MR. GREINER.—Mr. Chairman, it seems to me that the parent Society should take the initiative, at least, in encouraging these local chapters, rather than the local chapters taking the initiative in that respect; and if the parent Society takes the initiative, there should be something definite as a basis for the local members to work upon. The most definite basis that I can think of is a draft of a Constitution for such associations, outlining the objects and principles on which they are to be organized and worked. If the parent Society, the Board of Direction of the American Society, draws up such a Constitution or draft, and sends it to the different local associations, so that all may have uniformity in their methods and their workings, and encourages the formation of those associations in other cities, I think that would be the first step toward obtaining some definite and good results from local associations.

I cannot see that we are going to get any real benefit from local associations as they are now organized and worked. They have originated, you might say, from local members, who are already members of local clubs. There is always a little jealousy at the start. There is always a feeling that any new organization like that will interfere with the social functions and the technical work of the local club, so that that feeling, to a certain extent, must be offset by some definite object which is outlined right from the headquarters. The members of these local associations of the American Society of Civil Engineers should feel that they are just as much at home in their own town, in the discussion of papers, and taking an interest in the business of the local association, as though they lived right here in New York. Therefore, the first thing that the Board of Direction ought to do, is to initiate something definite for these associations to work upon.

Mention was made about discussing the seventeen points that were raised. That discussion can go on for a year. What we want to do is to act on something definite, not merely to discuss these things; these seventeen points might be referred to the local associations, which are very fond of talking. So let them talk and discuss; but let us get down to something definite and appoint a committee to draw up a recom-

mendation to the American Society, and let the Board of Direction take the initiative; then submit their views to the local associations, and let them discuss it for three months, if need be. I make that as a motion.

(Motion duly seconded.)

THE CHAIRMAN.—I should like to speak on one point that Mr. Greiner has raised, that I think may not have been stated in the exact terms to express the idea which he has in mind. It would seem to me that the worst possible thing that could happen would be for the Board of Direction to draft a Constitution and by-laws for any local association. It would be quite a competent and legal thing for it to formulate—in the quickest and easiest way—regulations under which the local associations must form their own Constitution and by-laws.

MR. A. M. HUNT.—A Constitution and by-laws that would fit them all would not fit San Francisco, also.

THE CHAIRMAN.—As I understood Mr. Greiner's motion, it was that a committee of this conference be appointed to-day to draft our recommendations to the Board.

MR. GREINER.—I agree with that. I want to correct the impression that the recommendation was that the Board should form a Constitution.

THE CHAIRMAN.—I did not so understand your recommendation, because we have to assume that the Board has prepared the general form that the associations adopt; what we need more particularly are regulations covering the relations of these associations with the public, as well as with the Society.

A MEMBER.—I am heartily in favor of that.

MR. OCKERSON.—I am not one of those who are fond of speaking too often, but as a member of the Board of Direction, I want to say that the meeting was called as a meeting of the associations. The Board wanted to get the associations together, to formulate certain common grounds on which they could act. The Board acceded to, and in a measure financed, this meeting, and it expects that this meeting will formulate something on which the Board can take action in regard to local associations. That is right, Mr. Secretary?

MR. CHARLES WARREN HUNT.—I think it is. It seems to me, with reference to the relation between the Society itself and its local associations, that we are in a transition state. A great many of the points that were raised, if they are to be carried out, would require a revision of the Constitution of the Society—the question of student members, for instance. I would like to call attention to the amendment to the Constitution, which is to come before the Annual Meeting to-morrow, and doubtless will go before the Society for approval. I believe it will be carried by a large majority. In my opinion, the increase in the number of districts will rather change the general condition.

It has been stated here two or three times—it has been hinted, at least—that it ought to be the function of local associations to select members of the Nominating Committee, to select their representatives on the Board of Direction. That would be a very perfect method of representation, provided the local associations could be made the same as the districts into which the Society is divided. Now, whether that is possible or not, I think it ought to be looked into very carefully, as I believe that would be the ideal way in which the Society could be represented on the Board of Direction.

We have now only seven districts, and you know how large they are; but even if we multiply the number of them by two it would be impossible to get as many districts as there are local associations now, and their number will increase. Would it be possible to sub-divide the country so that we could have twelve local sub-divisions outside of New York? That question ought to receive very careful consideration.

It occurs to me, speaking from the standpoint of the Board of Direction—incidentally, I am very proud to-day, because I was the originator of the local associations in this Society—it seems to me that it would be exceedingly helpful to the Board of Direction if this meeting could, through a committee, formulate the different things which they deem desirable to be carried out, and let the Board of Direction decide the method by which those things shall be carried out, whether by revision of the Constitution, if necessary, on certain points, or whether by the authority now vested in the Board.

In other words, I think the suggestions should be in general terms and not attempt to cover all these questions, some of which involve Constitutional matters; and I believe that this meeting, in which the various associations are so well represented, ought to present to the Board of Direction general ideas on which it can work; otherwise, it will be almost impossible for the Board to do anything. I notice that there is a general consensus of opinion on many things in various localities. If this body could formulate certain general principles which the Board of Direction can give the local associations power to carry out at the present time, it would be a step in the right direction. It could also suggest to the Board certain other things which might be done by making changes in the Constitution.

MR. ENDICOTT.—The only way to get at this is by way of a committee, as suggested by the Chairman. Mr. Ockerson's motion is a good one; but I hope that this committee will formulate a consensus of the views of this meeting and send copies of it out to the different associations, so that when the matter comes up for consideration by the Board it will have gotten down to the foundation; when it comes before the Board it will be in better shape for action and will receive better consideration than if a recommendation were launched now after an hour or two.

THE CHAIRMAN.—It seems to the Chair that, after all, we want something constructive, and the Board wants something constructive. The representatives of the local associations are in better position to crystallize the views of this conference than any one else. After we agree to anything it should go back to the associations, and we may get some additional ideas which may be of great value in strengthening the first action of the Board of Direction.

We ought to give the committee some time—the Chair feels that it should have the afternoon—to draft something, and we could meet this evening. As I understand, the delegates were supposed to take one or two days, or whatever time was necessary to prepare recommendations. And though I realize that the Great White Way has its attractions, nevertheless, this conference is too important to the Society to allow that to stand in the way of a meeting this evening. The Chair feels strongly that the committee ought to have the afternoon for its work, and that we should meet at 8 o'clock.

MR. HOUGH.—A committee of five, including the Chair, would probably be a little better than a committee of three, would cover the territory a little better. I move as an amendment to the motion that a committee of five be appointed by the Chair, and that they have the afternoon—four besides the Chair.

THE CHAIRMAN.—Is that acceptable?

MR. LEEDS.—I ask the question whether the situation may not arise that that committee of five may desire more time than this afternoon, so it might be better to have the meeting on Friday morning. Then there would be ample time——

THE CHAIRMAN.—It seems to the Chair that all the committee can do is to suggest something, that the real discussion must come from each of the fourteen delegates; I do believe that a committee—and three is large enough—could draft the findings of this conference. The recommendations may be all wrong, but it can draft something definite for debate, and after this afternoon we can determine whether the committee has additional work to do.

A MEMBER.—Isn't everybody going to stay over until Friday?

THE CHAIRMAN.—There is an intervening time—unless the delegates feel that they are occupied this evening, I suggest that we meet then.

MR. HOUGH.—We ought to get to work and push the thing, because I do not believe any of us have any too much time to spare. For my part, I must return as soon as possible. I think we ought to meet this evening and do as much as possible to-day, and no doubt all of us will be here on Friday, and we can wind up our work then.

MR. LUNDGREN.—Mr. Hunt being so thoroughly familiar with all this, I venture to offer a suggestion that he be a member of the committee.

SECRETARY DALLIS.—Mr. Charles Warren Hunt?

THE CHAIRMAN.—Quite so.

MR. CHARLES WARREN HUNT.—I am not a delegate, but I will be very glad to give the committee any assistance in my power.

MR. OCKERSON.—Do I understand you accepted five or not?

THE CHAIRMAN.—The motion is that a committee of five be appointed, four with the Chair, to draft resolutions which will be considered at a session at 8 o'clock this evening. Those in favor of the motion signify by saying "aye"; contrary minded, "no".

It is agreed to.

Now, what is your pleasure? Do we want to continue in session a little longer discussing these matters? Mr. Hunt may have some suggestions to offer.

MR. CHARLES WARREN HUNT.—I have only one suggestion to make, that, for the information of the members of the Society, a full record of this meeting, after revision by each of the speakers, be printed in *Proceedings*, together with whatever resolutions are adopted by this meeting afterward. This discussion has been very interesting, and would be interesting to every member of the Society, and I think that ought to be done. I cannot make a motion, not being a member.

MR. HALL.—I move that that be done.

(Motion seconded.)

THE CHAIRMAN.—I will state the motion. Mr. Hall moves that it is the sense of this meeting that the report in full of this conference be published in the *Proceedings* after editing by the Secretary and after revision by the speakers.

MR. A. M. HUNT.—Would it be competent to offer an amendment that instead of being published in the *Proceedings*, that it be published separately in such a way that it can be handled separately? Say, for instance, at the meeting of the local associations. I think it would be very much more convenient and very much more available if it were printed separately.

MR. CHARLES WARREN HUNT.—I accept the amendment, to the motion that I did not make, if you will make it both ways, to be published in *Proceedings*, and also in separate form.

(Motion duly seconded.)

THE CHAIRMAN.—Those in favor of the motion signify by saying "aye"; contrary minded, "no".

It is agreed to.

Now, gentlemen, shall we have some further discussion or shall we adjourn?

A MEMBER.—Why not leave the work to the committee?

A MEMBER.—I move that we adjourn until 8 o'clock this evening.

(Motion seconded and carried.)

Adjourned.

New York, January 19th, 1915.—Evening Session.—The Conference of Presidents of Local Associations met at 8 P. M., Richard L. Humphrey in the chair, Park A. Dallis, Secretary, and present, also, Messrs. A. M. Hunt, Cappelen, Hough, Jonah, Leeds, Hall, and Vincent, pursuant to adjournment.

THE CHAIRMAN.—Gentlemen, your committee has been at work all the afternoon drafting these recommendations. I am going to ask Mr. Hunt to explain some corrections in them.

MR. A. M. HUNT.—The copies that have been made of the recommendations of the Committee this afternoon require two corrections which have not yet been inserted in the copies that you have. Under Section II, to Paragraph *g*-1 there should be added the sentence, "The President and the Secretary-Treasurer shall be elected by votes of all members of the district."

A MEMBER.—Excuse me, that means all grades of membership as well as corporate members; in other words, does that include junior members?

THE CHAIRMAN.—We have made no distinction there. We do say, Mr. Hunt, in another section, that "all members of any grade without payment of additional dues shall be members", but we do not decide what their voting power shall be. I presume their voting power would be that of corporate members. We might leave that for the Board to decide, but I think, to make it clear, that we should say by the votes of the corporate members of the district.

MR. A. M. HUNT.—Under Section IV, "The Relation of the District Organizations and Local Sections to the Public", add to Paragraph *a* the words "with such organization".

THE CHAIRMAN.—Such "organizations", plural.

MR. A. M. HUNT.—Plural it should be.

SECRETARY DALLIS.—That is, the third section?

MR. A. M. HUNT.—No, under Paragraph *a*, "with such organizations". With those corrections I think the report as you have it in your hands is the recommendation of the Committee.

THE CHAIRMAN.—Now, of the fourteen men who are here representing local associations, there are present nine; is that right? There are fourteen altogether. Mr. Greiner and Mr. Lundgren will not be here, and Mr. Gregory will be here at 8:30, I understand. Mr. Beahan is not here. I do not know whether he will be here or not.

A MEMBER.—There is another man, Mr. Hawley, of Fort Worth, the Texas Association.

SECRETARY DALLIS.—There were fourteen of us this morning.

THE CHAIRMAN.—That was because we counted in Col. Ockerson.

A MEMBER.—I counted sixteen this morning.

THE CHAIRMAN.—That is because there were two from St. Louis and the gentlemen from Colorado and Tennessee. We had Messrs. Hunt,

Hawley, Gregory, Cappelen, Hough, Jonah, Leeds, Hall, Beahan, Vincent, Lundgren, Greiner, and Dallis, and the Chairman; but there are three who are not delegates.

A MEMBER.—That reduces the number to fourteen.

THE CHAIRMAN.—Yes.

SECRETARY DALLIS.—Does not Col. Ockerson represent St. Louis?

MR. JONAH.—No, I represent St. Louis, but Col. Ockerson explained the workings of our organization, as he is an older member than I am.

THE CHAIRMAN.—There are fourteen of us altogether. Now, gentlemen, what is your pleasure with these recommendations?

MR. A. M. HUNT.—It would be a very good plan if you would outline briefly the general plans adopted by the Committee this afternoon on which these recommendations were based, and the purpose of them.

THE CHAIRMAN.—The Committee felt that our recommendations to the Board of Direction should not go into too much detail, that it would be better to touch only the salient features and leave out all details; the idea being that whatever we agree to will be referred to the local associations for consideration, and that the recommendations with the discussion by the local associations should go to the Board of Direction. The thought was that, inasmuch as the Society will be redistricted, as in all probability the amendment offered to-morrow will go through, it would be desirable to create for each geographical district thus created, a district organization under which would come the present local associations; the district organization reporting to the Society and the local sections corresponding to our present associations, reporting to the district organization. The next logical point was the relation between the parent Society and each district, and we covered this, as you will note, by providing that the representatives should be elected by the direct vote of the members in the district which is intended to give direct representation; and this will probably mean that the members of the Nominating Committee and of the Board of Direction will be elected by the votes of the local members, the officers at large being nominated by the Nominating Committee and elected by the general vote of the Society.

Communications affecting the welfare of each district must go through the officers of the district; the Society shall support the district financially by meeting its expenses; it is also recommended that papers presented before the local sections or district organizations, shall be forwarded to the Society and, subject to the regulations of the Society, shall be published in the *Proceedings*; all other communications which have the approval of the district organization shall be printed by the Society in its *Proceedings*. It is recommended that the Board of Direction prepare a Constitution which will cover the regulations governing all districts; that the district by-laws shall be submitted to the

Board of Direction for its approval. The by-laws of the local sections shall be prepared by the section, and approved by the district organization. The Committee believes that there should be a limit to the number of members requisite to form a local section. The Committee is also of the opinion that there should be no allotment of funds to meet the expenses of the local section.

The recommendations further discuss the relations of both the district organizations and the local sections to the public, and permit the affiliation with branch organizations of other national societies and other local engineering societies and clubs; they prohibit, however, the local section from joining in joint resolutions with other organizations; as individual members they can participate in the resolutions; the local section may itself act in matters of local interest. If, however, the matter affects the Engineering Profession, the matter must be transmitted to the Board of Direction before such action is taken; it is the intention that the district organizations and local sections shall act as public agents of the Society in promoting the influence of the Society; and in reporting to the Society any local matter which may affect the Society or the Engineering Profession, in order that proper action may be taken.

This is the general scope of these recommendations on which the Board of Direction is expected to take such action as it may deem proper. The programme is that each local association discuss the recommendations and that before we adjourn, we provide some way in which these discussions and recommendations may be correlated and transmitted to the Board of Direction.

The matter is now before the Conference, and the Chair would like to know whether it is desired that the recommendations be read section by section.

MR. HALL.—I suggest that we read this, section by section, and give it all the consideration that the members present desire.

THE CHAIRMAN.—I suggest that our Secretary read the draft, unless Mr. Hunt would like to read it.

MR. A. M. HUNT (Reading).—

"The conference recommends the adoption of the proposed Amendment to the Constitution, re-districting the Society. Assuming that this Amendment is adopted it recommends the adoption of the following:

"I. Creation of District Organizations and Local Sections.

"*a*.—That there be created a District Organization for each geographical district created by the Amendment above referred to.

"*b*.—All members, of any grade, without the payment of additional dues, shall be members of their District Organization.

"*c*.—It is recommended that the present Local Associations be designated as Local Sections, and

"*d*.—That short descriptive designations be adopted for the District Organizations, and for the Local Sections."

MR. LEEDS.—I would suggest that as each one of these sub-heads is read, unless there are any objections thereto, that they stand approved. Then we will clean up each one as we go along.

SECRETARY DALLIS.—I second that.

THE CHAIRMAN.—It is moved and seconded that each section be adopted or amended as it is read, that is, be considered as adopted. Those in favor of the motion say "aye"; contrary minded, "no".

It is agreed to.

MR. A. M. HUNT.—I think that, having read these first four paragraphs without that in view, it would be competent to ask whether there are any amendments or objections to them.

MR. CAPPELEN.—I move that Section I, including Paragraphs *a*, *b*, *c*, and *d*, be adopted.

(Motion duly seconded.)

THE CHAIRMAN.—Those in favor of the motion signify by saying "aye"; contrary minded, "no".

The recommendations are adopted.

MR. A. M. HUNT (Reading).—

"II. The Relation of the Parent Society to the District Organization.

"*a*.—District representation in Society affairs shall be by the vote of the members in the district."

THE CHAIRMAN.—We might explain that that applies to members of the Nominating Committee and also of the Board of Direction; that is, that the member of the Board of Direction representing the district shall be elected by the members in that district.

THE SECRETARY.—I suggest that the word "corporate" members be placed there.

THE CHAIRMAN.—Yes; "shall be by the vote of the corporate members". I was going to say, when Mr. Leeds made his motion about each paragraph, that we read right straight through each section, taking from *a* to *i*, instead of taking each separately, because it gives a better idea if you take it all through than by reading each sub-division separately. Unless there is objection we will adopt these recommendations by groups.

MR. CAPPELEN.—Yes, by groups.

MR. A. M. HUNT (Reading).—

"*b*.—Communications from the Society to its members in all matters relating to the District shall be through the officers of the District.

"*c*.—The Society shall not rebate any portion of the dues of the District Organization, but its Board of Direction should make an allotment to cover the business expenses of this organization.

"*d.*—1. The Constitutions of the District Organizations shall be identical; shall deal with basic principles affecting the general welfare of the Society, and shall be drawn by the Board of Direction of the Society.

"2.—By-laws covering local conditions shall be drawn by District Organizations, and shall be approved by the Board of Direction of the Society.

"*e.*—Technical papers presented before the District Organizations or Local Sections shall be published by the Society, subject to its regulations.

"*f.*—All communications that have received the sanction of the District Organization shall be published by the Society for the information of its whole membership."

I think it might be proper to remark, in connection with that paragraph, that the term "communications" there used is distinct from the matter of papers. It refers to resolutions and to declarations of public policy.

MR. HALL.—Reverting back to Paragraph *b*, "Communications from the Society to its members in all matters relating to the District shall be through the officers of the District", that is, in distinction to general Society matters which go out through the Secretary to the individual members?

MR. A. M. HUNT.—Yes, sir.

"*g.*—1. The District Organization shall consist of a President, as many Vice-Presidents as there are Local Sections in the District, and a Secretary-Treasurer.

"2.—The office of the Secretary-Treasurer shall be the office of the District Organization.

"*h.*—The Annual Convention of the Society shall be held in the districts in turn; the locality for holding the Convention shall be determined by the Board of Direction upon the recommendation of the District in which the Convention is to be held, except as may be determined under extraordinary conditions by the Board of Direction.

"*i.*—When any question as to the power of any District Organization or Local Section to act on any matter shall arise, the Board of Direction shall, upon the request of the District Organization, decide the matter."

MR. HOUGH.—It is only a suggestion that I have in connection with this: In Paragraph *g*—1, "the district organization shall consist of a President, as many Vice-Presidents as there are Local Sections in the District, and a Secretary-Treasurer", why cannot that be fixed up something like this, and save a lot of work: Each section has a President, and these automatically form a board, and this board elects a President and Secretary-Treasurer from its number.

MR. A. M. HUNT.—The purpose of having the President and Secretary-Treasurer elected by the general membership was this: It may be that there will be members of the Society in the district who will not care to become members of any local association. They, however,

should have representation, and it was written in that way with the idea that there would be a Vice-President, practically, from each local section, but if there was any outside of the local sections they would have a voice in the election of the President and Secretary-Treasurer of the district.

MR. HALL.—It would probably mean that the President of the local section would become, *ex officio*, Vice-President of the district.

THE CHAIRMAN.—It does not necessarily follow. That is a matter to be decided by the local section.

MR. LEEDS.—Would it not be wiser not to leave it to the local section; let there be a general rule for the entire Society?

THE CHAIRMAN.—It seemed to the Committee that that is a detail that might require subsequent action. It has to be promulgated by the Board. It is intended that each section shall have a representative, elected by all the members in the district, and that there shall be two other representatives, thus each member of the district organization, whether or not he is a member of a section, shall have an opportunity for voting for an officer of the district organization.

MR. LEEDS.—It should be with the idea of simplifying the whole matter at this time.

MR. CAPPELEN.—It seems to me that Section II is fine, and I move its adoption as a whole.

THE CHAIRMAN.—Is the motion seconded?

(Motion duly seconded.)

THE CHAIRMAN.—Is there any debate? Those in favor signify by saying "aye"; contrary minded, "no".

The section is adopted.

MR. A. M. HUNT (Reading).—

"Section III. Relation of the District Organization to the Local Sections.

"*a.*—A Local Section shall consist of at least 25 members.

"*b.*—Communications from any Local Section to the Society shall be through its District Organization."

MR. HOUGH.—Now, Mr. Chairman, I don't think that we ought to fix the number as high as you have fixed it in this article, as to what should constitute a Local Section. That is true, particularly in the West. Spokane could not have made a start three years ago had the requirement been 25 members. Tacoma cannot make a start now. There is no reason why Tacoma, with 15 or 20 members, as I believe they have—I believe I counted 15 to-night in the Year Book—should not be able to start a section and build it up in the same way that we built ourselves up. We are building it larger all the time. We now have 30 members. We intend to increase that number decidedly within the next year or so. We have some members who will come in in a short time, to increase our membership, and Tacoma might

do exactly the same thing, but under this they would not be allowed to start at all; and it seems as if that ought to be left so that the local section could fix a number, that is, say whether they ought to have an organization there, or leave it to the parent Society to say.

THE CHAIRMAN.—What is your suggestion?

MR. HOUGH.—I should put it 15.

THE CHAIRMAN.—Would it meet your views if we said that a Local Section shall consist of at least 25 members, unless the District Organization shall approve of a lesser number, but in no case less than 15?

MR. HOUGH.—Yes; that would be all right. I should leave it optional, so that we can build up, and not try to fix a number which many of the Western towns would never have.

MR. A. M. HUNT.—The only objection to leaving practically no lower limit is that it would tend to increase the number of representatives on the Board of Direction of the District, and that even two or three, if the limit was thrown off entirely, might club together and say, "We will demand a local organization and have as full representation on the governing body of our District as an association with two or three hundred members."

MR. HALL.—Since Mr. Hough has brought the matter to our attention, I am inclined to agree with him. I know the conditions in Tacoma, and considering that our local associations meet often at luncheon and at spare times, it would be very inconvenient to compel them to come over and meet with us in Seattle; and I would certainly be quite willing that they have an association of their own.

THE CHAIRMAN.—I was going to say that we might put after that, unless otherwise provided by the district organization, and that the district organization say what the minimum should be; that is, no local section could be organized with less than 25 men without the approval of the district organization; that is all right; fix it in some way so that these sections can be organized.

MR. A. M. HUNT.—I think that definite provision could be made so that an association could be organized anywhere, but I do not feel that an organization with 15 members should be as powerful in the control of affairs in the district as one of larger membership; if we are going to reduce even to the limit of 25, it seems to me small.

THE CHAIRMAN.—That is true, Mr. Hunt, but you know that in the United States Senate each State has two representatives——

MR. A. M. HUNT.—They have the House of Representatives as well as the Senate, in that case.

MR. HOUGH.—You will not have an association in Montana for a good many years, and you will never have one in Idaho in the lifetime of any of us here; and you will have only two or three in the State of Washington.

Mr. A. M. Hunt.—I am not taking any stand as arguing against the formation of the section, but simply how it will be viewed by some of the local sections of larger membership, where a practically equal voice in the affairs of a district is given to a small as well as a large group. I think it is a matter worthy of consideration.

The Chairman.—I think so, too.

Mr. Vincent.—As I understand, this plan is for the purpose of creating local organizations, or at least, inducing them to organize; as our deliberations here to-night will only result in suggesting to the Board of Direction certain recommendations, we will probably have a chance to thresh that out with them, and they will probably consider it very seriously before any definite action is taken; but, being from the West, where some of the rest of our friends are, and knowing as well as I do how few places there are for some of these organizations, I feel as though 25 is a good many, and at the same time I agree with Mr. Hunt that we do not want to give the local organizations too much authority, too much representation.

The Chairman.—It seems to me, gentlemen, that if we put in the hands of the district organization the right to grant permission for the local sections to organize, they are not going to grant permission if it will lower the voting power of the other local sections, and it seems to me that it is a matter which might be left to the district organization, fixing a minimum of 15.

Mr. A. M. Hunt.—I suggest that we cut out the numbers and say, "A Local Section may be organized wherever authorized by the District Organization."

The Chairman.—There should be at least 25 members. If there are localities where this is not possible, give the district organizations the right to reduce the number to 15; and surely we ought not to attempt to organize any local section with less than 15 members.

Mr. Cappelen.—May I ask: suppose there are 10 members in Montana, 7 members in South Dakota, and 8 members in North Dakota, who ask the district of the Northwest Society to become members, there is absolutely nothing to prevent these gentlemen from coming in. They are not forming a local Society at all; they are simply becoming members of the district.

The Chairman.—Quite so; they become members automatically. The question of the number of members, as far as the locality is concerned, ought to be left to the district, except that we ought to fix a minimum limitation.

Mr. Cappelen.—Yes, we ought to fix a limitation. There is nothing to limit Montana, South Dakota, North Dakota, or any of these States from coming into one district, as long as they do not form a separate organization, and that I understand is not the idea. The idea is that

these members of the American Society want to come into one district and help the whole district along.

THE CHAIRMAN.—They come into a district automatically; they have no volition in the matter.

MR. CAPPELEN.—To me it looks as if they ought to have a representation of 15 at least before they become a local organization.

THE CHAIRMAN.—Answering Mr. Hough: if you cannot get together 15 members you should not have a local section.

MR. HOUGH.—You must have a city of 100 000 inhabitants to muster 15.

MR. A. M. HUNT.—I move that the number be changed from 25 to 15, adding the words "unless by special recommendation of the Board of Direction of the District".

THE CHAIRMAN.—The Chair would suggest that the idea of 25 should be fixed. The local section should consist of at least 25 members, except under special conditions, when the district organization may reduce this number to 15.

MR. LEEDS.—I move that as a substitute.

MR. HOUGH.—I second that motion.

MR. HALL.—I am in favor of that motion, but I want to call attention to one thing. We are really not giving any power to local associations, as such, except the power to organize its membership that elects the district officers.

MR. A. M. HUNT.—They do not elect the Vice-President.

MR. HALL.—They elect him.

THE CHAIRMAN.—If you have a local section, for example, in Seattle, of 100 or 200 members, its influence in the district will be much greater than a smaller section of only 25 members, or of the individual who is not a member of a section.

MR. HALL.—That will not do any harm. It is a matter of detail which will be worked out later; for instance, if a local organization has power to vote in the districts as an organization, of course, it becomes of some importance, but there is no provision for that, so far; their vote is as individuals.

MR. A. M. HUNT.—No; but the Board of Direction of the District will meet the outside matters as the Board of Direction of the Society; and its Vice-Presidents will probably be the Presidents of the local sections.

THE CHAIRMAN.—In other words, 10 men would have as much power as any section of 100, and that is not a fair proposition. It seems to me that we ought to indicate to the Board that it ought to be 25, and never less than 15.

SECRETARY DALLIS.—I have had a little experience along this line in connection with the Civils and Mechanicals. We organized the Civils with a membership of about 15, and the Mechanicals with a

membership of about 12; and I think 12 is rather small. We have had a hard struggle, but we are coming out. I think 18 is small enough for a tentative organization, and in these recommendations we should state that a section should not be recognized as a full-fledged local section unless there are 25 members, but that each district be permitted to grant a tentative organization in special cases where it meets with its approval.

Mr. Leeds.—We have to hit a mean in this matter. If we require that all the sections shall be 25, we may be putting too much of a handicap on the small organizations. On the other hand, if we permit any small number of members to organize a section anywhere, we give too much power to the very small section. On the other hand, if we are going to allow them to have a vote, then the organization becomes too complicated, so that it seems to me that the motion as given is the best, because it sets 25 as a fair number.

Now, if a certain section wants to form with a less number, they then have the burden of proof put upon them that they are worthy of receiving the same ability to vote as the section of 25 or more, and, if the district organization changes, the one that is going to be hurt by it, if at all, is the one that grants the power. So it seems to me that the motion as drawn by the Chairman is the best.

Mr. Vincent.—It seems to me that it might be well if this matter could be fixed so that local organizations could be formed with as few as 15 members, with the consent of the district organization, and not allow them a vote until they could have 25 members. Possibly that does not look practical to some of you, but it was an idea that occurred to me since the number 25 seems to be the minimum which most of those present think should be allowed a voting representation.

The Chairman.—It seems to the Chair that it is rather difficult to say when a section shall be considered full-fledged; if the district organization shall consider that there is not sufficient reason, or that they do not care to authorize a local section of less than 25 members, then the members interested should wait until they can secure the requisite number to form a section. It should be borne in mind that, even with 25 members, it takes considerable effort to keep the section active, and that to create sections which soon become inactive or pass out of existence is not desirable. Sections ought not to be formed that do not have enough members to keep them properly active or in existence.

Mr. Cappelen.—I agree, absolutely. We are here to-day asking for certain concessions from the Board of Direction of the American Society of Civil Engineers, and it seems to me that if the Board will grant us what is provided here, we can go back home and report certainly that we had a very successful meeting.

You are going too far when you ask for little bits of local organizations that would not add a thing, and you are going to give them voting power in the districts, and through the districts in the Society. That is far beyond anything that we ever expected, and I believe that if you will adopt this paragraph just as it is, I think it will be for the benefit of everybody concerned. I make the motion that the section be adopted as it stands.

THE CHAIRMAN.—The Chair would state that there is already a motion before the conference.

MR. CAPPELEN.—I make this as an amendment to the motion.

MR. VINCENT.—I second that.

THE CHAIRMAN.—We have a motion with an amendment. The amendment practically strikes out the motion, leaving the section as it was originally. Is there any debate on that?

MR. LEEDS.—It seems to me that it should stand as the motion was previously made.

THE CHAIRMAN.—Yes; in other words, Mr. Cappelen's amendment is to destroy the motion.

MR. CAPPELEN.—Yes.

THE CHAIRMAN.—The amendment originally offered, Paragraph "*a*", was amended to read: "A Local Section shall consist of at least 25 members; except that the District Organization shall have the power to authorize a Local Section having a lesser number, but in no case less than 15 members." That was the substance of it. Mr. Cappelen moves to strike out that amendment, which I think is unnecessary, because we can vote on the amendment and defeat it, and that would leave it as it was originally, that is, if that is the sense of the meeting.

The Chair feels that Mr. Hough and some of the Western men have something on their side; in some of the outlying districts it is very difficult to start a section, and it seems to me that if the district organization is willing to divide up the voting power by the creation of a section of a lesser number of members they should have the power to do so, if it is not obligatory on those affected. They are the ones who ought to have the right to decide whether such action is desirable.

It seems to me we might offer the suggestion to the Board, to do as it sees fit. The question is on the amendment as moved.

A MEMBER.—Will you state it?

THE CHAIRMAN.—The amendment is to give the District power to create a local section of not less than 15 members, at its discretion. Mr. Cappelen withdrew the motion——

MR. CAPPELEN.—The motion is right back on the question.

THE CHAIRMAN.—We are voting on the amendment to Paragraph "*a*". The Chair will call for the ayes. Those in favor of the amend-

ment signify by saying "aye"; contrary minded, "no". The Chair thinks the ayes have it.

The paragraph as amended is agreed to.

Mr. Hunt, will you read the remaining paragraphs?

MR. A. M. HUNT (Reading).—

"*b.*—Communications from any Local Section to the Society shall be through its District Organization.

"*c.*—No portion of the Society funds allotted for District Organization expenses shall be applied to the expenses of a Local Section.

"*d.*—The by-laws of a Local Section shall be approved by its District Organization."

With reference to those three, no action has been taken.

MR. HALL.—I move the adoption of Section III, with its four paragraphs, as amended.

MR. HOUGH.—I second that motion.

THE CHAIRMAN.—All those in favor signify by saying "aye"; contrary minded, "no". The ayes have it. It is agreed to.

MR. A. M. HUNT (Reading).—

"Section IV. The Relation of the District Organizations and Local Sections to the Public.

"*a.*—A Local Section may affiliate with other local technical organizations, but must not, as a body, take action on any matter with such organizations.

"*b.*—A Local Section, as a body, may take action on matters of local interest, but must not act on matters of a National character affecting the Profession at large without the approval of the Board of Direction."

I think, Mr. Chairman, that that should be amplified to express the exact meaning of the Committee, "without the approval of the Board of Direction of the Society".

THE CHAIRMAN.—Yes; "without the approval of the Board of Direction of the Society".

MR. A. M. HUNT (Reading).—

"*c.*—It shall be the duty of each Local Section to report to the Society through its District Organization any matter affecting the general welfare of the Profession.

"All of the foregoing recommendations can be carried out without an Amendment to the Constitution, except in so far as they relate to the representation of each District in the Society.

"It is recommended that the Board of Direction take the necessary steps to amend the Constitution so as to permit the procedure recommended for District representation.

"Respectfully submitted,

"JOHN E. GREINER
"JOHN L. HALL
"A. M. HUNT
"F. G. JONAH
"RICHARD L. HUMPHREY,
"Chairman."

THE CHAIRMAN.—The Chair will entertain a motion.

MR. HALL.—I move that Section IV be adopted.

THE CHAIRMAN.—Is that seconded?

MR. A. M. HUNT.—I second the motion.

SECRETARY DALLIS.—Mr. Chairman, before you put that, I would like to say that Paragraph *a* in Section IV, ties the association down rather closely with regard to affiliations with other local societies. They should have the right to take action on local matters with affiliated societies the same as they take action locally.

THE CHAIRMAN.—The difference is this, that the members can take action individually in the affiliated organizations, but they cannot take action as a body with the affiliated organizations. There is a distinction there; for example, in Philadelphia, we are forming a society composed of the branch organizations of the National Societies, and at the request of the electrical engineers, we have adopted a paragraph which states that where there is action on a resolution—where the Constitution and by-laws of the National Society do not permit—it shall not be adopted without a statement to the effect that the branch organization as a body of that National Society cannot participate in that resolution.

SECRETARY DALLIS.—We have in Atlanta an affiliated Society taking action on local affairs. The record of that has been sent to the Society, and then noted by the parent Society as to any action we have taken. I do not see myself but what the technical reading of that article ties the hands of the local association in affiliating with the other bodies.

THE CHAIRMAN.—When you speak of the affiliated organization, what is the relation of the individual members to that organization?

SECRETARY DALLIS.—They are members through the association, and are represented on the Executive Board by representatives from the section. The six organizations have six executive committeemen appointed by each organization, and those six men have the power to make by-laws, rules, and regulations, and appoint committees to look into city affairs. We are trying to eliminate politics in engineering, and, for one thing, we took up, not long ago, that is, as an association, we approved a request to get a line of precise levels run to Atlanta and along there. This matter was taken up originally by a commission of one hundred men in the Society. The motion made before that committee was made by a member of this affiliation, also a member of the American Society of Civil Engineers, and also a representative of the Mechanicals, and our Senator was notified that it was the unanimous request of the entire membership. I may be wrong on that, but we want some authority.

THE CHAIRMAN.—The Chair has had a good deal of experience in Philadelphia with such a proposition. We are trying to form an

Engineering Society. The purpose of that, and of this particular section, is to strengthen engineering in communities by bringing all the engineers together, whether they be civil, mechanical, or other engineers, under a common head; there is nothing to prevent individual members from acting in such a society, but it does prohibit the local branch—a local branch of our Society, at least—from joining other branches in a joint action.

MR. HALL.—To clear up the matter a little, I would say that the purpose of that was to prevent involving the American Society in anything contrary to its policy, by the participation of its local organization. The members may vote as they please, but it is not desirable that a local association of the American Society of Civil Engineers should lose its identity, by reason of its participation in these local affiliated societies. It has to adopt policies in line with the policy of the American Society as a whole.

MR. A. M. HUNT.—I think that I may throw a little light on the matter by saying that the intention was this—or the thing desired to be avoided, rather, was this—that the membership of a local association of civil engineers, participating as an affiliated body, might be overruled by a majority, none of whom was a member of the American Society of Civil Engineers; in which case, if the action were taken as a body, it would be represented as the action of the local association of the American Society of Civil Engineers. The individual members of the local association may vote on any action to be taken by the affiliated body; and if the sense of the local association is adverse to that, the local association could then meet and express its own views as a body.

SECRETARY DALLIS.—I think the intent is in accord with my ideas of the proposition; yet affiliation in Atlanta does not lose the identity of any of the organizations. The identity of the organization is carried strictly and held foremost. The idea is to give us, if we are strong enough to affiliate with a body, some right; if we are not strong enough to affiliate and hold our own with those bodies, we had better wait until we get strong enough to cope with them.

I believe that the American Society of Civil Engineers would have its interests protected rather well on all the affiliated societies. It so happens that on committees, and on the Executive Committee, although we are only allowed one member, we quite often, by having members in two societies, have more than one representative. At present, of the six men in Atlanta, there are two who are members of the American Society of Civil Engineers; but they are not put on in that way. So I do not believe that by giving us a little right to affiliate, that tying our hands with regard to local matters will really be of service to the Society, but will be a detriment.

MR. CAPPELEN.—You should add to this clause simply this, that

"without consideration by the district organization and its recommendation to the parent Society"; exactly the same suggestion for the next paragraph, "*b*", "a local section may take action on matters of local interest, but must not act on matters of a National character affecting the Profession at large without the approval of the Board of Direction", I would insert "without the consent of the district organization and its recommendation to the parent Society".

THE CHAIRMAN.—It seems to me the two things are different. For example, take a city which has the four National Societies, Civil, Mechanical, Electrical, and Mining, and they are joined together as affiliated organizations. If we did not have such a provision, then you would have the condition where three of these affiliated organizations might meet, pass a resolution, and it would go out as one adopted by the associated engineering societies of that place, and state that this organization consists of the affiliated local branches of the Civil, Mechanical, Electrical, and Mining Societies. By implication it would involve the Society.

MR. CAPPELEN.—You could do that without passing it through the District.

THE CHAIRMAN.—Yes, I understand; but this is to allow no joint action with any other society.

MR. CAPPELEN.—Outside of the American Society.

THE CHAIRMAN.—Outside of the American Society of Civil Engineers.

MR. HOUGH.—We already have our joint society in working order, and our committee in that joint society is composed of four members from each of the National Societies appointed by the Presidents of these various societies; for instance, it appears, at the present time, that the affiliated societies are represented by the Mechanical, the Civil and the Electrical. That gives them 12 members on their Executive Committee; but four members are appointed from each society by the President of that representative society, and according to this, we would get tangled up.

THE CHAIRMAN.—I do not see that at all, because, for instance, in the Philadelphia plan, you form the Engineers' Society; our Philadelphia association affiliates with the Engineers' Society, but the Engineers' Society can adopt any resolution of a general character it wants; and every member of the Philadelphia Society participates in that resolution as individuals; the resolution goes out, not as the action of the affiliated organizations, but as an engineering society resolution and our association is not tied up by joint action with any other organization.

MR. VINCENT.—I do not see how you are going to prevent the public from believing that the action of the affiliated societies is the action of the organizations that belong to it; and it seems to me

that the public is likely to think that the Mechanical, the Electrical, the Civil, are each responsible for the passage of such resolutions as may go through; each is a member of it, even if they do not take action as a body.

THE CHAIRMAN.—The by-laws of the association prescribe that if the by-laws of a parent Society prohibit that, the resolution must bear on its face a statement that the branch organization is not responsible for it.

MR. LEEDS.—There is nothing in here, as I read it, that requires that. It seems to me that your requirement in Philadelphia is an excellent one, but as it is here, it seems to me that the public, as Mr. Vincent has just said, might get the same idea, placing the responsibility for a certain line of action on the American Society of Civil Engineers, without considering whether they took it as individuals, or as a body.

THE CHAIRMAN.—I see.

MR. LEEDS.—The only recourse there, is simply for the members of the local section of the American Society of Civil Engineers to meet, and, as you might say, render a minority report. That would have to be done in every case for the defence of the parent Society, unless some such provision as you speak of being in existence in Philadelphia is actually included here, that it shall be required; but even there, from what I have seen of affairs in Los Angeles, the public very often fails to take notice of anything of that sort. So I think the only redress is the rendering of some actual protest by the members of the local section of the American Society of Civil Engineers as a body.

MR. CAPPELEN.—I still believe I am right. Section III, Paragraph *b*, states: "Communications from any Local Section"; how are you going to get around that?

THE CHAIRMAN.—That is true.

MR. CAPPELEN.—Do you want a local organization to come in and make any resolution or recommendation they want to, according to Paragraphs *a* and *b* of Section IV? And Paragraph *c* states absolutely that you cannot do it, and that is the way it ought to be. Paragraph *b*, of Section III states: "Communications from any Local Section to the Society shall be through its District Organization".

THE CHAIRMAN.—Are you applying that to IV-*a*?

MR. CAPPELEN.—Section IV, Paragraph *b*, states: "A Local Section, as a body, may take action on matters of local interest, but must not act on matters of a National character affecting the Profession at large without the approval of the Board of Direction".

THE CHAIRMAN.—Yes, but *a* provides that a local section may not join other local sections of technical organizations as a body, or treat any matters.

MR. CAPPELEN.—They cannot pass any resolution without going through the district organization?

THE CHAIRMAN.—In the first place, a local section by itself can act on any matter of local interest. It can act on a matter of National interest provided it gets the approval of the Board of Direction of the Society, but it cannot act without it.

MR. CAPPELEN.—In Paragraph *c* you say it cannot act at all except through its district organization.

MR. HOUGH.—That is simply in the matter of communications between the local sections.

MR. HALL.—Would it clear up the matter if we should add to it: "That is to say, any action taken by such affiliated society shall not be binding upon the local section of the American Society of Civil Engineers"? That is about the sense of it.

THE CHAIRMAN.—No; Mr. Charles Warren Hunt, our Secretary, gave us his opinion on that. His theory is that we ought not to act upon matters, whether they be local or of a general character, with any other technical organization.

MR. HALL.—Does it mean, for instance, if all the societies have one opinion on a matter, that they cannot take action separately, suppose they all have one mind on a subject, and they all take one action on it?

THE CHAIRMAN.—That is permissible. Let us assume that in an engineering society only the four are affiliated; the Civils could not join the other three on certain matters, but the Civils could take up the matter of licensing engineers, and could go on record with the permission of the Board of Direction of the Society. That action might be identical with that of the other three societies.

MR. HALL.—That is about the same thing as we are doing in Seattle; we have a Joint Committee from the different societies to consider certain matters, but that committee has not power to bind any one of those societies as a Joint Committee. They may all agree on the same thing, but they must report back to the societies which appointed the Joint Committee. Those societies must take action separately. I think that is the purpose of this provision.

THE CHAIRMAN.—We might add a paragraph to the effect that action by a local section shall be in accordance with the provisions of Paragraph *b*; that is, the local section can act individually, but not as a body.

MR. VINCENT.—If our local organizations affiliate with the local organizations of other engineering societies, we cannot escape the responsibility before the public of what the affiliated society does—not very well—even though we insert a statement that none of the societies individually is responsible for the action taken. The public

does not know which one or which two or which three of the affiliated societies are responsible for the acts taken.

MR. GREGORY.—With relation to conditions in Louisiana, all the members of the local organizations of the American Society, I believe, are members of the Louisiana Engineering Society. That is a very much larger body, having more than 200 members. All the action in the past, taken in regard to legislation, the licensing of engineers, and that sort of thing, has been suggested by and carried through by the society. Now, we, as members of the Louisiana Engineering Society, act merely as members of that society. We are not committing the American Society of Civil Engineers to any particular policy. We are merely acting within our rights, as members of that local Engineering Society.

For instance, six years ago the society started an agitation in regard to licensing engineers, and without doing anything very radical at that time, they had the Legislature pass a bill which made it necessary within a given time for all engineers and surveyors to register as such. A great many men registered at that time who probably had no right to register, that is, no right to their qualifications as engineers or surveyors. The two grades were created at that time.

At the last meeting of the Legislature, which occurred last summer, a bill was passed which was fathered by the Louisiana Engineering Society, in which were added certain other provisions. I should have said that after the time had expired for registration as a civil engineer, if a man wished to practice civil engineering in the State, he must appear before an examining Board.

The personnel of that Board was made up by appointment by the Governor from a list furnished by the Louisiana Engineering Society. That was a part of the bill. Now, the amended bill is very much like the first one, with the exception that each civil engineer must register yearly with the Board of Examiners and pay a license fee of $3 for practicing civil engineering, or if he be a surveyor, a license fee of $1 per year, and he must register before a certain date.

The income from this is to be used for paying the expenses of the Board, and if a man comes to the State of Louisiana and wishes to practice civil engineering, he applies for an examination, and if he passes the examination a certificate is issued allowing him to practice in the State of Louisiana. This applies only to civil engineers. The question has never been raised, so far as I know, as to the broad interpretation of the term "civil engineers", whether it shall mean everything outside of military engineering. It has not been applied to marine engineering, mechanical, or electrical engineering, as ordinarily understood.

SECRETARY DALLIS.—I still feel that it is more or less a technical point. I also feel that it is almost useless for the Atlanta members of the American Society to affiliate with the other societies with this restriction. The representative would simply feel that he had his hands tied; and the members will not be in a position to take action in regard to local affairs.

In order to affiliate, we ought to have some authority on local affairs. If we have not, I would be in favor of considering not affiliating.

THE CHAIRMAN.—As the Chair sees it, this permits the affiliation with other organizations in matters of sociability, and other matters, not affecting the general Profession of engineering. In matters solely of local interest where some question is involved, whether of politics or otherwise, there is nothing to prevent the local section of this Society from taking part, or in matters of National importance, with the approval of the Board of Direction.

SECRETARY DALLIS.—It does not say so in this section.

THE CHAIRMAN.—The Chair thought it read that way.

MR. JONAH.—The reason for affiliation is usually to obtain a successful club. The membership in one branch of the Profession might be so limited that they could not maintain a successful working club by themselves, but associated with two or more branches of the Profession, they can make a very good club. That is the history of the St. Louis Engineers' Club. When it was a club, restricted in its membership to the civil engineers, it was a small struggling club with an indifferent attendance, but when they affiliated with the mining engineers, the electrical engineers, and the mechanical engineers, they made a very strong club, and I think that is the primary reason for affiliation.

THE CHAIRMAN.—It was stated in Philadelphia by the Philadelphia Branch of the Electrical Engineers, that the St. Louis affiliation had been unsuccessful, so far as the local chapter of Electrical Engineers was concerned, because that chapter had lost its autonomy and identity and had really retrograded.

MR. JONAH.—They may have lost their identity, and I cannot speak for the Electrical Engineers. They still have their representation in our meetings. For instance, they have the right to present their papers in rotation.

MR. HALL.—I do not want to weary you with much speaking, but as I see this, I think it ought to be left just as it is, for without such a provision the local association of the American Society would not be in a position to make a protest on any action taken by the affiliated societies. It might happen that in a meeting our membership would be very poorly represented, or not at all, and something might come up to be acted on, and, when our members got together, they would

see that it was an unwise measure. Without a provision such as this, they would not be in a position to take action. So that, with the amount of time we have had to study the wording, I think it is perhaps as good as we can do.

MR. CAPPELEN.—I move their adoption as presented.

THE CHAIRMAN.—That is, Section IV, the two concluding paragraphs.

(Motion seconded.)

THE CHAIRMAN.—Those in favor of the motion signify by saying "aye"; contrary minded, "no". The ayes appear to have it. The ayes have it.

Now, Gentlemen, the programme is this: I presume each gentleman will be the medium by which the result of the deliberations of this conference is taken to the local organizations. It is thought that these recommendations should go to the Board of Direction, after they have been edited, and with the approval and comments of the various associations. It is open now for the conference to decide what to do. It is suggested that perhaps the editing of this and the transmission might be left to some one or some committee or otherwise that the conference may designate.

MR. LEEDS.—Before we come to that there is another matter that I would like to speak on, though it is a detail and possibly may be, as such, ruled out of order as not pertinent to this general matter, yet at the same time it seems to me so important that we should make some recommendations to the Board of Direction on it, namely, that matter of the Board of Direction asking the local districts or sections, as may be determined best, at least an opinion as to the qualifications of applicants for membership.

THE CHAIRMAN.—When this matter was discussed in committee, it was felt that with this plan going through—at least, the Secretary of the Society expressed that belief—that the Board would write to the district officers for information, it would become a regular practice for the Board to write to the district organizations regarding new members in the district.

MR. LEEDS.—Would it not be well to put that on record?

SECRETARY DALLIS.—Well, I am in favor of the parent Society taking this matter up with the districts, and our local organizations; but I am not in favor of having that made as a written recommendation to them, I think they should do that.

MR. A. M. HUNT.—Mr. Chairman, I would suggest that our Chairman be requested to ask the Secretary of the Society to transmit to each of the local sections a corrected copy of these recommendations which we have in hand, with the idea that they shall be discussed with the local associations; that the reports of the local associations be rendered and returned to the Secretary of the Society; and that the

Secretary of the Society, with Mr. Humphrey, our present Chairman, codify these and lay them before the Board of Direction of the Society at the earliest date possible. I would offer that as a motion.

THE CHAIRMAN.—Is that motion seconded?

SECRETARY DALLIS.—I second the motion.

MR. CAPPELEN.—Is there any objection to submitting this draft to the Board of Direction as it is?

THE CHAIRMAN.—There is no objection, but I think there is a feeling in the Committee, shared by the Secretary of the Society, that it might be desirable to have the local associations discuss this, and that valuable points might be added to these suggestions of the conference.

MR. CAPPELEN.—How are you going to bring it before the Society?

THE CHAIRMAN.—I understand, it is the Secretary's idea that after being codified it would go to the Board of Direction with the statement that this had been adopted by the conference on January 19th, had been submitted to the local associations, and the suggestions were submitted to the Board for its information. In other words, we would have to codify the criticism of each local association on the subject.

MR. CAPPELEN.—Do you want that to go to the Board of Direction or to you?

THE CHAIRMAN.—No, we would use the machinery of the Society to send this out and collate the replies, which the Secretary and the Chairman of the conference would codify and transmit to the Board of Direction; isn't that the understanding?

MR. A. M. HUNT.—That is the understanding.

MR. GREGORY.—Would the Chairman give us the exact wording of Section 3-*a*? I believe that was changed.

THE CHAIRMAN.—"A Local Section shall consist of at least 25 members except that the District Organization shall have the power to authorize a reduction in this number, but in no case shall it be less than 15 members." That is, at the discretion of the district organization, it can be reduced to 15 members.

MR. HALL.—There is one point that, perhaps, ought to be considered at this time. The plan is to send this report to the local associations. Ought it not at some time, either now or a little later, go to all the membership of this Society before it is considered to be final? A good many men would be affected by this who are not members of the local associations, as they become members of these district organizations, automatically, and possibly they might not be in favor of it.

THE CHAIRMAN.—The Chair is unable to say whether that would be proper. It seems to me, however, that this conference came into existence under the authority of the Board of Direction. It might be desirable to leave to the Board of Direction the discretionary power of sending this to the membership at large, as it sees fit.

SECRETARY DALLIS.—This morning a motion was carried that the minutes of this meeting appear in the *Proceedings*, and go to every member.

THE CHAIRMAN.—The Chair understands that all that we do will be printed in the *Proceedings*, and also in separate form, and go to the members of the Society.

MR. VINCENT.—In one of the resolutions was there not a time fixed by which this report should be returned after discussion?

THE CHAIRMAN.—No; I think Mr. Hall's suggestion fixed three months, but that was merely his individual opinion, and was not acted on by the conference.

MR. VINCENT.—Might it not be well for us now, in this motion, to have an understanding as to the time by which this action shall be considered, and returned?

THE CHAIRMAN.—The Chair was going to suggest that, but he thinks, perhaps, it might be as well to have that as a separate resolution; not to have too omnibus a resolution, but agree to one thing at a time.

Is there any further discussion of Mr. Hunt's resolution, which, in substance, is to have the Secretary of the Society send this to the local associations with the request that they transmit any criticism to him, and that the codified replies, discussions, and recommendations be transmitted by the Chairman of the section to the Board of Direction.

MR JONAH.—I think that the Secretary, when he sends that out, should request the return of the criticisms within a certain length of time.

THE CHAIRMAN.—My thought was that we should not decide now. Let us discuss the date when the replies should come in. Is there any further discussion on Mr. Hunt's motion? Those in favor of the motion signify by saying "aye"; contrary minded, "no".

It is agreed to.

I judge from the remarks this morning, that most associations have fixed times for meetings. The Philadelphia Association had a meeting last night, and they do not meet regularly again until April. It seems to me that this important matter might be made a special order of business at a special meeting called to consider this alone; and it seems to me not unreasonable that the reply be required to be returned within thirty days.

MR. A. M. HUNT.—I would suggest a definite date. I would suggest March 15th.

THE CHAIRMAN.—Will you make that as a motion, Mr. Hunt?

MR. A. M. HUNT.—I will offer that as a motion, that the Secretary of the Society be instructed, in sending out these communications, to state that any criticisms to receive consideration must be in the hands of the Secretary of the Society not later than March 15th.

THE CHAIRMAN.—May I suggest that that be a little more mandatory, that each association send its approval, disapproval, or comments on these recommendations, not later than March 15th. We ought to hear from every one of the local associations.

MR. CAPPELEN.—I second that motion.

THE CHAIRMAN.—Gentlemen, is there any discussion of the motion?

SECRETARY DALLIS.—I think it would be well, before that is sent in, that the records of this meeting and the *Proceedings* go before the membership; and it is a question as to what *Proceedings* those minutes will appear in, as to whether or not March 15th is a proper date.

THE CHAIRMAN.—What do you mean, what number of the *Proceedings?*

SECRETARY DALLIS.—Yes; do we get this in the *Proceedings* of February?

THE CHAIRMAN.—I fancy it will go in the February *Proceedings*, the Report of the Annual Meeting.

MR. HOUGH.—I do not see why we could not get it right away, if we could have a copy of this, our regular meeting comes on the second Friday of next month. We will not have another meeting for 60 days; and, of course, if we wait until this printed matter comes out, we cannot take action on it. It will be very nearly a month before that comes out, and comes before us.

THE CHAIRMAN.—The Secretary of the Society stated, and I think it was accepted, that each member would have a chance to revise his remarks, after the stenographer had transcribed the notes. The copy has to go to each of the fourteen members to be corrected and returned, and that is going to take time, so that I do not think we ought to tie up the action with the stenographer's report. It seem to me, further, that these recommendations are perfectly clear, and that the representatives here will be at the meetings of the local sections and can explain what took place.

SECRETARY DALLIS.—I would suggest, as an amendment to Mr. Hunt's motion, that the words "to be sent in with comments at a time designated by the Secretary of the Society", be added, and leave that to Mr. Hunt. The purpose is that Mr. Hunt may see that we have all had a chance to look over all the data in regard to this matter, and that we are not pushed for time. Two weeks, or three, would be ample time after we have the *Proceedings*, and the membership has looked them over, to make our comments and send them in, but those minutes may be delayed in getting into the *Proceedings*.

THE CHAIRMAN.—May I ask what relation there is between the transcript of the deliberations of this conference and the ratification?

SECRETARY DALLIS.—So that the membership at large may see the result of these deliberations.

THE CHAIRMAN.—The membership at large is not going to vote on

this. The Chair feels that each member here is just as capable of transmitting to his association the recommendations of this conference as the *Proceedings* could possibly be. We want action, and we do not want to delay this indefinitely. If returned by March 15th that would certainly delay it long enough.

MR. CAPPELEN.—The Northwestern Association's regular meeting is to-morrow, but has been postponed. They said they would simply wait until I came back and told them all about it. They said, "Then we will have the meeting and do exactly what you say; you tell us the whole proposition, so we will be ready to have a meeting called and get ready to proceed whatever happens"; and they can act right away on the documents that I have in my pocket.

THE CHAIRMAN.—The Chair does not want, Mr. Dallis, to stop you from making a motion, but it seems that it would undoubtedly delay it to wait for two months. Are we ready for the question? Those in favor of the motion signify by saying "aye"; contrary minded, "no".

It is passed.

Are there any other matters that the conference wishes to bring before the meeting?

MR. A. M. HUNT.—Before we adjourn it would be quite proper to move a vote of thanks to the Board of Direction for giving the representatives of the local associations the opportunity to submit these recommendations. It certainly is a recognition of the local associations, and an expression of very keen friendliness on the part of the Board of Direction to them; and I think it is quite worth while to take such action.

MR. HALL.—I wish to second that motion.

THE CHAIRMAN.—The Chair thinks it might be phrased a little better.

MR. A. M. HUNT.—It could be phrased very much better.

THE CHAIRMAN.—That this conference of representatives of local associations wishes to record its hearty appreciation for the opportunity afforded it by the Board of Direction of the Society to offer suggestions as to the ways in which the activity and strength of the local associations may be promoted.

MR. A. M. HUNT.—Aye, aye, sir.

THE CHAIRMAN.—Does that cover your idea?

MR. A. M. HUNT.—Very good.

THE CHAIRMAN.—Is that resolution seconded?

MR. HALL.—I second it.

THE CHAIRMAN.—Those in favor say "aye"; contrary minded, "no".

It is carried.

MR. CAPPELEN.—I move that we offer a vote of thanks to the local committee of the fourteen members who worked to-day and made such a splendid presentation of the facts as they have done.

(Motion seconded.)

THE CHAIRMAN.—It is moved and seconded that the conference records its appreciation of the work of the committee that prepared the preliminary draft of the recommendations.

MR. HOUGH.—I second the motion.

THE CHAIRMAN.—Those in favor signify by saying "aye"; contrary minded, "no".

The resolution is agreed to.

Is there any further business that the members of the conference wish to bring up?

MR. HOUGH.—There is one thing more; that is about re-districting the Society. It seems as if, especially in the western part of the country, the Western members could offer some suggestions to the Board about how that ought to be done. As to the division now, the Western country is peculiarly located, and a certain redivision might make it much better than some others. Some suggestions from the Western members might help them out, and the Board could take them for what they are worth, at least.

THE CHAIRMAN.—The Chair understands that Mr. Hough's motion is to the effect that, should the amendment redistricting the Society be adopted, it is desirable that the Board of Direction shall consult the local sections in fixing the new districts.

MR. HOUGH.—That is the idea.

MR. HALL.—There is some little question of the propriety of a motion of that sort. It seems to me that the Board of Direction, having given us the consideration that they have, would probably not overlook us in so important a matter as that, even if we did not take action on it.

MR. LEEDS.—That is a detail that can as well be left as that matter of membership. The spirit of the Board of Direction is one of co-operation with the local associations.

MR. JONAH.—That expresses the idea I have in mind. We do not wish to do too much suggesting to the Board of Direction.

THE CHAIRMAN.—The Chair did not hear the motion seconded. The Chair would say further that he thinks if we could have these three or four basic ideas adopted by the Society, we would have more than justified our conference; the details matter little if the principle is adopted. It is a vital principle that is involved, which means much for the future growth of the Society. It means a direct representation from the districts themselves, and it gives the outside members of the Society a standing, which they have never had before. I think that principle is too important to be involved by little details which will work out in all probability to our satisfaction.

These recommendations are merely a skeleton, and in years to come, if they are adopted, there will be many amplifications, which will increase the power of each district.

Is there any further business?

SECRETARY DALLIS.—Will there be any other meetings of this conference?

THE CHAIRMAN.—The Chair does not understand that any other meeting will be necessary. The original belief, I understand, was that we would be in session several days; but I think that was predicated on the assumption that this might be a rather inharmonious gathering, and might not be able to get together; apparently we have been able to discharge our business with much greater rapidity than was anticipated. So the Chair sees no reason for another meeting, unless the members want one; in fact, he does not think it would be fair to continue the meeting indefinitely, unless there is some prospect of new business of importance. We had better adjourn *sine die;* that is, we are out of existence, unless the Board calls us back.

The Chair, in closing, wishes to express to the members his appreciation of their activity. We ought to congratulate ourselves on having accomplished a very valuable piece of work. He hopes that each one will take back to the locality from which he came an enthusiasm that will galvanize that locality into renewed activity.

Those in favor of adjournment say "aye"; contrary minded, "no".

(The conference then adjourned.)

ANNOUNCEMENTS

The House of the Society is open from 9 A. M. to 10 P. M., every day, except Sundays, Fourth of July, Thanksgiving Day, and Christmas Day.

FUTURE MEETINGS

May 5th, 1915.—8.30 P. M.—A regular business meeting will be held, and a paper by Charles H. Paul, M. Am. Soc. C. E., and A. B. Mayhew, Assoc. M. Am. Soc. C. E., entitled "Temperature Changes in Mass Concrete", will be presented for discussion.

This paper is printed in this number of *Proceedings*.

May 19th, 1915.—8.30 P. M.—At this meeting, a paper by J. D. Galloway, M. Am. Soc. C. E., entitled "The Design of Hydro-Electric Power Plants", will be presented for discussion.

This paper is printed in this number of *Proceedings*.

June 2d, 1915.—8.30 P. M.—This will be a regular business meeting. A paper by W. L. Du Moulin, Assoc. M. Am. Soc. C. E., entitled "The Pumping Plant of the Morenci Water Company", will be presented for discussion.

This paper is printed in this number of *Proceedings*.

ANNUAL CONVENTION

The Annual Convention of the Society will be held in San Francisco, Cal., September 16th, 17th, and 18th, 1915, being the Thursday, Friday, and Saturday immediately preceding the International Engineering Congress, which is to be held during the week beginning September 20th.

Three of the other National Engineering Societies, under whose auspices the International Engineering Congress is to be held, will also hold meetings in San Francisco at about that time.

Arrangements have been made for a special train, and possibly more than one train, to accommodate the members of all of these Societies who wish to attend their own meeting as well as the Congress.

A general circular containing information as to transportation, hotel rates, etc., has been issued, and later a programme more in detail will be sent out.

SEARCHES IN THE LIBRARY

In January, 1902, the Secretary was authorized to make searches in the Library, upon request, and to charge therefor the actual cost to the Society for the extra work required. Since that time many searches have been made, and bibliographies and other information on special subjects furnished.

The resulting satisfaction, to the members who have made use of the resources of the Society in this manner, has been expressed fre-

quently, and leaves little doubt that if it were generally known to the membership that such work would be undertaken, many would avail themselves of it.

The cost is trifling compared with the value of the time of an engineer who looks up such matters himself, and the work can be performed quite as well, and much more quickly, by persons familiar with the Library.

In asking that such work be undertaken, members should specify clearly the subject to be covered, and whether references to general books only are desired, or whether a complete bibliography, involving search through periodical literature, is desired.

In making a search it sometimes happens that references are found which are not readily accessible to the person for whom the search is made. In that case the material may be reproduced by photography, and this can be done for members at the cost of the work to the Society, which is small. This method is particularly useful when there are drawings or figures in the text, which would be very expensive to reproduce by hand.

PAPERS AND DISCUSSIONS

Members and others who take part in the oral discussions of the papers presented are urged to revise their remarks promptly. Written communications from those who cannot attend the meetings should be sent in at the earliest possible date after the issue of a paper in *Proceedings.*

All papers accepted by the Publication Committee are classified by the Committee with respect to their availability for discussion at meetings.

Papers which, from their general nature, appear to be of a character suitable for oral discussion, will be published as heretofore in *Proceedings,* and set down for presentation to a future meeting of the Society, and on these, oral discussions, as well as written communications, will be solicited.

All papers which do not come under this heading, that is to say, those which from their mathematical or technical nature, in the opinion of the Committee are not adapted to oral discussion, will not be scheduled for presentation to any meeting. Such papers will be published in *Proceedings* in the same manner as those which are to be presented at meetings, but written discussions only will be requested for subsequent publication in *Proceedings* and with the paper in the volumes of *Transactions.*

The Board of Direction has adopted rules for the preparation and presentation of papers, which will be found on page 429 of the August, 1913, *Proceedings.*

LOCAL ASSOCIATIONS OF MEMBERS OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS

San Francisco Association

The San Francisco Association of Members of the American Society of Civil Engineers holds regular bi-monthly meetings, with banquet, and weekly informal luncheons. The former are held at 6 P. M., at the Palace Hotel, on the third Friday of February, April, June, August, October, and December, the last being the Annual Meeting of the Association.

Informal luncheons are held at 12.15 P. M., every Wednesday, and the place of meeting may be ascertained by communicating with the Secretary of the Association, E. T. Thurston, Jr., 713 Mechanics' Institute, 57 Post Street.

The by-laws of the Association provide for the extension of hospitality to any member of the Society who may be temporarily in San Francisco, and any such member will be gladly welcomed as a guest.

Colorado Association

The meetings of the Colorado Association of Members of the American Society of Civil Engineers (Denver, Colo.) are held on the second Saturday of each month, except July and August. The hour and place of meeting are not fixed, but this information will be furnished on application to the Secretary, Roger W. Toll, 700 Tramway Building, Denver, Colo. The meetings are usually preceded by an informal dinner. Members of the American Society of Civil Engineers will be welcomed at these meetings.

Weekly luncheons are held on Wednesdays, at 12.30 P. M., at the Albany Hotel.

Visiting members are urged to attend the meetings and luncheons.

(Abstract of Minutes of Meetings)

February 27th, 1915.—The Special Meeting was called to order at 1.30 P. M., at the Albany Hotel; President Vincent in the chair; Roger W. Toll, Secretary; and present, also, 21 members.

President Vincent read the minutes of the Conference of Representatives of the Local Associations, held in New York City, on January 19th, 1915. The recommendations adopted by that Conference were generally discussed by those present, and on motion, duly seconded, it was unanimously resolved that the Association does not approve of them.

In the absence of the Chairman of the Committee appointed to prepare a bill providing for the Licensing of Civil Engineers in the State of Colorado, Mr. A. O. Ridgway stated that as there had not been sufficient time to allow the Association to consider the bill, it had been introduced in the Legislature, but not as coming from the Association. After a general discussion of the subject, on motion, duly seconded, it was resolved that the Association is opposed to the passage of any bill to license civil engineers at this time, and that the President and Secretary be instructed to see the proper legislative authorities and urge that the bill be withdrawn or defeated.

On motion, duly seconded, Mr. H. S. Crocker was instructed to advise the Board of Direction of the Society of the action taken by the Association in regard to this bill.

A letter from the Secretary of the Society requesting suggestions in regard to holding one of the Spring meetings of the Society at some place other than New York City, was read.

On motion, duly seconded, the Secretary of the Association was instructed to call the attention of the members to the desirability of becoming members of the International Engineering Congress to be held in San Francisco.

Adjourned.

March 13th, 1915.—The meeting was called to order; President Vincent in the chair; J. Y. Jewett, acting as Secretary; and present, also, 21 members and guests.

The minutes of the Special Meeting of February 27th, 1915, were read and approved.

The Report of the Committee appointed to draft a bill for the Licensing of Civil Engineers was presented by Mr. J. E. Field. On motion, duly seconded, the report was accepted and the Committee discharged.

Communications were read from the Philadelphia, Cleveland, and Portland, Ore., Associations, regarding the action taken by said Associations on the Recommendations of the Conference of Presidents of Local Associations held in New York City on January 19th, 1915.

A paper by Mr. A. J. Allan, on "A Tramp Across an Unexplored Country", describing a reconnaissance survey for the Grand Trunk Railway, south and west of Hudson Bay, was presented by the author and illustrated with lantern slides. A vote of thanks was tendered Mr. Allan for his interesting paper.

Adjourned.

Atlanta Association

The Atlanta Association of Members of the American Society of Civil Engineers was organized on March 14th, 1912. The Association holds its meetings at the University Club, Atlanta, Ga.

At the meeting of the Association on January 9th, 1915, the following officers were elected for the ensuing year: President, Park A. Dallis; First Vice-President, B. M. Hall; Second Vice-President, P. H. Norcross; Secretary-Treasurer, T. P. Branch.

Baltimore Association

On May 6th, 1914, the Baltimore Association of Members of the American Society of Civil Engineers was organized, a Constitution adopted, and the following officers were elected: J. E. Greiner, President; Francis Lee Stuart, First Vice-President; L. H. Beach, Second Vice-President; Harry D. Williar, Jr., Secretary-Treasurer; and Messrs. H. D. Bush, B. T. Fendall, B. P. Harrison, Calvin W. Hendrick, Oscar F. Lackey, M. A. Long, and A. A. Thompson, Directors.

At its meeting of September 2d, 1914, the Board of Direction considered and approved the proposed Constitution of the Baltimore Association of Members of the American Society of Civil Engineers.

Cleveland Association

The proposed Constitution of the Cleveland Association of Members of the American Society of Civil Engineers was considered and approved by the Board of Direction of the Society on January 6th, 1915.

The following officers have been elected: President, Willard Beahan; Vice-President, Robert Hoffmann; Secretary-Treasurer, George H. Tinker.

Louisiana Association

The Louisiana Association of Members of the American Society of Civil Engineers (New Orleans, La.) has been organized with the following officers: Frank M. Kerr, President; J. F. Coleman, and W. B. Gregory, Vice-Presidents; A. M. N. Blamphin, Treasurer; and L. C. Datz, Secretary.

Northwestern Association

The proposed Constitution of the Northwestern Association of Members of the American Society of Civil Engineers (St. Paul and Minneapolis, Minn.) was considered and approved by the Board of Direction of the Society on November 4th, 1914. F. W. Cappelen is President and R. D. Thomas, Secretary.

Philadelphia Association

The meetings of the Association are held at the Engineers' Club of Philadelphia, 1317 Spruce Street.

At the meeting of the Association on October 5th, 1914, the following officers were elected for the ensuing year: President, Richard L. Humphrey; Vice-Presidents, F. Herbert Snow, and William Hunter; Directors, John Sterling Deans, John W. Ledoux, Edgar Marburg, and H. S. Smith; Treasurer, S. M. Swaab; and Secretary, W. L. Stevenson.

Portland, Ore., Association

At the meeting of the Association on October 21st, 1914, the following officers were elected for the ensuing year: President, George C. Mason; First Vice-President, W. S. Turner; Second Vice-President, John T. Whistler; Treasurer, G. B. Hegardt; and Secretary, Charles J. McGonigle.

St. Louis Association

The proposed Constitution of the St. Louis Association of Members of the American Society of Civil Engineers was considered and approved by the Board of Direction of the Society on October 7th, 1914.

The following officers have been elected: President, J. A. Ockerson; First Vice-President, Edward E. Wall; Second Vice-President, F. J. Jonah; Secretary-Treasurer, Gurdon G. Black. The meetings of the Association are held at the Engineers' Club Auditorium.

Seattle Association

The Seattle Association of Members of the American Society of Civil Engineers was organized on June 30th, 1913. At its meeting of January 25th, 1915, the following officers were elected for the ensu-

ing year: President, R. H. Ober; Vice-President, A. S. Downey; and Secretary-Treasurer, Carl H. Reeves.

(Abstract of Minutes of Meeting)

February 22d, 1915.—The meeting was called to order at 12.15 P. M., at the College Club; Vice-President A. S. Downey in the chair; Carl H. Reeves, Secretary; and present, also, 18 members and guests.

The minutes of the Annual Meeting, January 25th, 1915, were read and approved.

Richard Khuen, M. Am. Soc. C. E., addressed the meeting on engineering and technical matters in the Eastern United States.

Mr. John L. Hall, the Association's representative at the Conference of Presidents of Local Associations, held in New York City on January 19th, 1915, opened the discussion on the report of that Conference, and communications on the subject, from the Secretary of the Society and Mr. S. H. Hedges, were also read.

On motion, duly seconded, the Association unanimously endorsed the general programme and specific recommendations adopted by the Conference of Presidents of Local Associations.

Mr. C. C. More called attention to the present method of election to membership in the Society by the Board of Direction, and suggested that applicants for membership be investigated and reported on by the nearest Local Association, as well as by the endorsers named by the applicant.

Adjourned.

Southern California Association

The Southern California Association of Members of the American Society of Civil Engineers (Los Angeles, Cal.) holds regular bimonthly meetings, with banquet, on the second Wednesday of February, April, June, August, October, and December, the last being the Annual Meeting of the Association.

Informal luncheons are held at 12.15 P. M. every Wednesday, and the place of meeting may be ascertained from the Secretary of the Association, W. K. Barnard, 515 Central Building, Los Angeles, Cal.

The by-laws of the Association provide for the extension of hospitality to any member of the Society who may be temporarily in Los Angeles, and any such member will be gladly welcomed as a guest at any of the meetings or luncheons.

Spokane Association

The proposed Constitution of the Spokane Association of Members of the American Society of Civil Engineers was considered and approved by the Board of Direction of the Society on March 4th, 1914. Ulysses B. Hough is President.

Texas Association

The proposed Constitution of the Texas Association of Members of the American Society of Civil Engineers was considered and approved by the Board of Direction of the Society on December 31st, 1913. The headquarters of the Association is Dallas, Tex. John B. Hawley is President.

MINUTES OF MEETINGS OF SPECIAL COMMITTEES TO REPORT UPON ENGINEERING SUBJECTS

Special Committee on Steel Columns and Struts

March 10th, 1915.—The meeting was held at the Bureau of Standards, Washington, D. C. Present, A. L. Bowman (Chairman), James H. Edwards, Charles F. Loweth, Rudolph P. Miller, and Lewis D. Rights. The following visitors were present: Dr. G. R. Olshausen, Physicist of the Bureau of Standards; Mr. F. Auryansen, Bridge Engineer, Long Island Railroad; Mr. H. T. Welty, Engineer of Structures, New York Central and Hudson River Railroad; Messrs. L. C. Dilks and D. W. Bliem, of the Eastern Steel Company, New York City; and George E. Strehan, Assistant Engineer, Bureau of Buildings, New York City.

The Committee inspected a column, Bethlehem section, slenderness ratio, 120 $\frac{L}{R}$, heavy type, which was being tested in the machine.

The Progress Report, the question of discussions, and the closure of the discussion, were considered informally, and it was decided that no closure should be attempted until more discussion was received.

Various members of the Committee reported concerning the methods of plotting the strains at the different loadings, and the results of tests made to date and the comparison between the ultimates shown by the light and heavy sections were fully discussed.

On motion, it was decided that the Committee present a Progress Report to the next Annual Meeting of the Society, which report should contain full information as to the tests.

On motion, it was decided to call a meeting of the Committee in Washington, D. C., early in June.

PRIVILEGES OF ENGINEERING SOCIETIES EXTENDED TO MEMBERS OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS

Members of the American Society of Civil Engineers will be welcomed by the following Engineering Societies, both to the use of their Reading Rooms, and at all meetings:

American Institute of Mining Engineers, 29 West Thirty-ninth Street, New York City.

American Society of Mechanical Engineers, 29 West Thirty-ninth Street, New York City.

Architekten-Verein zu Berlin, Wilhelmstrasse 92, Berlin W. 66, Germany.

Associação dos Engenheiros Civis Portuguezes, Lisbon, Portugal.

Australasian Institute of Mining Engineers, Melbourne, Victoria, Australia.

Boston Society of Civil Engineers, 715 Tremont Temple, Boston, Mass.

Brooklyn Engineers' Club, 117 Remsen Street, Brooklyn, N. Y.

Canadian Society of Civil Engineers, 176 Mansfield Street, Montreal, Que., Canada.

Civil Engineers' Society of St. Paul, St. Paul, Minn.

Cleveland Engineering Society, Chamber of Commerce Building, Cleveland, Ohio.

Cleveland Institute of Engineers, Middlesbrough, England.

Dansk Ingeniorforening, Amaliegade 38, Copenhagen, Denmark.

Detroit Engineering Society, 46 Grand River Avenue, West, Detroit, Mich.

Engineers and Architects Club of Louisville, 1412 Starks Building, Louisville, Ky.

Engineers' Club of Baltimore, Baltimore, Md.

Engineers' Club of Minneapolis, 17 South Sixth Street, Minneapolis, Minn.

Engineers' Club of Philadelphia, 1317 Spruce Street, Philadelphia, Pa.

Engineers' Club of St. Louis, 3817 Olive Street, St. Louis, Mo.

Engineers' Club of Toronto, 96 King Street, West, Toronto, Ont., Canada.

Engineers' Society of Northeastern Pennsylvania, 415 Washington Avenue, Scranton, Pa.

Engineers' Society of Pennsylvania, 31 South Front Street, Harrisburg, Pa.

Engineers' Society of Western Pennsylvania, 2511 Oliver Building, Pittsburgh, Pa.

Institute of Marine Engineers, 58 Romford Road, Stratford, London, E., England.

Institution of Engineers of the River Plate, Calle 25 de Mayo 195, Buenos Aires, Argentine Republic.

Institution of Naval Architects, 5 Adelphi Terrace, London, W. C., England.

Junior Institution of Engineers, 39 Victoria Street, Westminster, S. W., London, England.

Koninklijk Instituut van Ingenieurs, The Hague, The Netherlands.

Louisiana Engineering Society, State Museum Building, Chartres and St. Ann Streets, New Orleans, La.

Memphis Engineering Society, Memphis, Tenn.

Midland Institute of Mining, Civil and Mechanical Engineers, Sheffield, England.

Montana Society of Engineers, Butte, Mont.

North of England Institute of Mining and Mechanical Engineers, Newcastle-upon-Tyne, England.

Oesterreichischer Ingenieur- und Architekten-Verein, Eschenbachgasse 9, Vienna, Austria.

Oregon Society of Civil Engineers, Portland, Ore.

Pacific Northwest Society of Engineers, 312 Central Building, Seattle, Wash.

Rochester Engineering Society, Rochester, N. Y.

Sachsischer Ingenieur- und Architekten-Verein, Dresden, Germany.

Sociedad Colombiana de Ingenieros, Bogota, Colombia.

Sociedad de Ingenieros del Peru, Lima, Peru.

Societe des Ingenieurs Civils de France, 19 rue Blanche, Paris, France.

Society of Engineers, 17 Victoria Street, Westminster, S. W., London, England.

Svenska Teknologforeningen, Brunkebergstorg 18, Stockholm, Sweden.

Tekniske Forening, Vestre Boulevard 18–1, Copenhagen, Denmark.

Western Society of Engineers, 1737 Monadnock Block, Chicago, Ill.

ACCESSIONS TO THE LIBRARY

(From March 2d to April 3d, 1915)

DONATIONS*

WORKING DATA FOR IRRIGATION ENGINEERS.

By E. A. Moritz, Assoc. M. Am. Soc. C. E. Cloth, 9¼ x 6 in., illus., 13 + 395 pp. New York, John Wiley & Sons, Inc.; London, Chapman & Hall, Limited, 1915. $4.00.

In this work, the author's object has been, it is stated, to produce a handbook or pocket-book for irrigation engineers, which will result in conservation of time and mental energy to the user, and to present material on the subject not readily found elsewhere. The usual steps followed in the development of an irrigation project are briefly discussed in the order of their sequence and this matter is followed by detailed explanations of the tables and diagrams of which the major portion of the book is said to consist. The method of irrigation by gravity has been kept in mind in discussing the various features, it is said, as being the most important, but most of the principles apply also to irrigation by pumping. The author states that a considerable portion of the subject-matter is original, the remainder to a large extent being taken from the publications and records of the United States Reclamation Service, and he hopes that the book will prove of value to irrigation and hydraulic engineers. The Contents are: List of Diagrams; List of Tables; Examination and Reconnaissance; Investigations and Surveys; Design of Irrigation Structures; Hydraulic Diagrams and Tables; Structural Diagrams and Tables; Miscellaneous Tables and Data; Specifications; Index.

LAND DRAINAGE:

A Treatise on the Design and Construction of Open and Closed Drains. By J. L. Parsons. Cloth, 9¼ x 6¼ in., illus., 11 + 165 pp. Chicago, The Myron C. Clark Publishing Co.; London, E. & F. N. Spon, Ltd., 1915. $1.50.

This treatise is offered, it is stated, with the hope that it may prove of assistance to those connected with the design, construction, maintenance, and general administration of land drainage enterprises, namely, the engineer, the contractor, the land owner, and the drainage district official. The author states that the volume has been made as complete as possible on all subjects connected with the successful drainage of agricultural lands by open and closed drains, including surveys, plans and specifications, designs, maintenance, estimates of cost, etc. In the Appendix he has given a copy of the judge's instructions to the jury in the trial of a drainage damage suit in an Iowa Court, which shows the basis on which damages for open drains should be allowed under the Iowa law. There are also tables of historical records of representative tile and open drains. The Chapter headings are: Preliminary Drainage Surveys; The Design of Tile Drains; Tile Drain Outlet Walls and Inlets; Design and Maintenance of Open Drains; Plans, Reports and Records; The Estimate of Costs of Drainage Systems; The Preparation and Enforcement of Drainage Specifications; The Division of Costs of Drainage Systems; The Quality and Inspection of Drain Tile; Appendix; Index.

THE OPERATION OF SEWAGE DISPOSAL PLANTS:

A Manual for the Practical Management of Sewage Disposal Works, with Suggestions as to Improvements in Design and Construction. By Francis E. Daniels. Cloth, 8¼ x 5½ in., illus., 136 pp. New York, Municipal Journal, 1914. $1.50.

The subject-matter contained in this book, it is stated, is based entirely on the author's personal observation of and experience with almost all known types and combinations of units of sewage disposal plants. It was first published serially in the *Municipal Journal*, but at the request of many sewage plant attendants and designing engineers, it has been put into book form with the hope that it will prove of value as a handy and practical manual. The author's main purpose, it is said, is to assist the plant attendant in keeping his plant at its highest efficiency at a minimum expenditure of cost and energy, by pointing out what he

* Unless otherwise specified, books in this list have been donated by the publishers.

should and should not do. He has also endeavored, it is stated, to show that poor designs are troublesome, costly, and inefficient, with the hope that more attention will be given to details which have a direct bearing on operation as well as on the fundamental principles of treatment processes. On account of the lack of reliable every-day data, the book is said to be wanting in detailed results of many kinds of sewage disposal processes and the effects on the various outputs caused by the different types of construction and their different modes of management and operation. The Contents are: Grit Chambers and Screens; Tanks; Filters; Disinfection; Chemical Precipitation and Electrolytic Treatment; Trade Wastes; Testing Stations; Making Tests; Records of Plant Operation; Index.

DESIGN OF STEEL BRIDGES:

Theory and Practice, for the Use of Civil Engineers and Students. By F. C. Kunz, M. Am. Soc. C. E. Cloth, 9¼ x 6¼ in., illus., 24 + 472 pp. New York and London, McGraw-Hill Book Company, Inc., 1915. $5.00.

This book, the preface states, is the first of four, each complete in itself, which are to include data collected by the author during thirty years of professional practice. The aim of this volume, it is stated, is to give the bridge engineer numerical examples and results of the best modern practice in designing and estimating steel bridges, and to serve him as a guide and aid in the calculation of stresses, sections, weights, etc. The text and methods of calculation, both graphic and algebraic, have been condensed, it is said, and fully cross-referenced to the tables and plates, in order to make all parts of the book readily accessible. Methods using influence lines have been preferred for graphic calculations, it is stated, and the simplest algebraic methods have been used. Arches without hinges and suspension bridges are not discussed in this volume because of their limited use, but the treatment of the various types of two-hinged arches is full, it is said, and intended for immediate use in design. The influence of lateral forces on the stresses in the main trusses of arch and cantilever bridges has been given special attention, the author states, on account of the increased use of alloy steels for span lengths. In Chapters XV and XVI, descriptions of existing and of a few completely designed long-span bridges are given, including analyzed weights, specifications of materials, loads and permissible unit stresses. Appended to several chapters is additional information on the subjects discussed, which, it is said, has been carefully compiled from the author's library and notes. The Appendix includes original data on foundation pressures of bridges and other structural work, and other useful tables, as well as Part First, Design, of the General Specifications for Steel Railway Bridges of the American Railway Engineering Association. The author has also added fifty-two plates which are intended to serve as a guide to the designer from the live and dead load assumptions to the last rivet spacing, without reference to the text. The Contents are: External Forces; General About Reactions and Influence Lines; Moments and Shears in Simple Spans; Stresses in Simple Trusses; Stresses in Bracing of Simple Spans; Types of Bridges and Principal Dimensions; Design of Floor; Beam and Plate Girder Bridges; Simple Truss Bridges; Skew Bridges and Bridges on Curves; Weights of Simple Span Bridges; Viaducts; Elevated Railroads; Movable Bridges and Turntables; Arch Bridges; Long Span Bridges in General and Examples; Cantilever Bridges; Additional Information on Long Span Bridges; Appendix; Index.

PLAIN AND REINFORCED CONCRETE ARCHES.

By J. Melan. Authorized Translation by D. B. Steinman, Jun. Am. Soc. C. E. Cloth, 9¼ x 6 in., illus., 10 + 161 pp. New York, John Wiley & Sons. Inc.; London, Chapman & Hall, Limited, 1915. $2.00.

As stated in the preface, this book is a translation of Professor Melan's article published in von Emperger's "Handbuch für Eisenbetonbau," the second revised edition (1912) of which is represented in this translation. Professor Melan's work is said to be one of the most thorough treatments of reinforced concrete arches in any language. In it the fundamental principles of arches is briefly discussed and a simple comprehensive treatment of stresses is given, together with analytic and graphic methods for the design of all types of concrete arches occurring in practice, as well as the effects of temperature, yielding abutments, and non-vertical loads. The translator states that the following special features should recommend this book to American engineers: Simple approximations and short cuts useful for preliminary and less exacting designs; easily applied formulas for determining in advance the best curve for an arch and the required dimensions and reinforcements; illustrations of the various methods described by numerical examples from actual practice; full explanations and demonstrations of the principles of the Melan system of arch construction; complete computations of analytic and

graphic stresses of two notable examples of reinforced concrete arches; and a chart for proportioning or investigating concrete sections with single or double reinforcement. It is stated that the notation has been modified in this translation, that an index of symbols is included and that all numerical examples and data have been converted from metric to English units. There is also a short bibliography of the subject. The Contents are: The Forces Acting on an Arch; The Internal Stresses in an Arch; The Three-Hinged Arch; The Hingeless Arch; Effects of Temperature and Displacement of the Abutments; Non-Vertical Loads; Approximate Methods for the Hingeless Arch; Two-Hinged and One-Hinged Arches; Arches with Elastic Abutments; Arches Continuous over Several Spans; Determining the Best Curve for Any Arch; Determining the Thickness for Any Arch; Proportioning Reinforced Concrete Arches; Calculating the Stresses in an Arch; Examples; References; Key to Plate I; Index.

EXAMINATION OF LUBRICATING OILS.

By Thomas B. Stillman. Cloth, 9 x 6 in., illus., 125 pp. Easton, Pa., The Chemical Publishing Co.; London, Williams & Norgate, 1914. $1.25.

The rapid advancement in the construction of machinery of various kinds requires, it is stated, corresponding varieties of oils for lubricating purposes and has also complicated the methods of testing such oils. This is particularly true, the author states, of the automobile and of cold storage specifications for lubricating oils. After describing the different methods and apparatus used in the various tests, the author gives specifications for different lubricating oils and fuel oils, together with analyses of such oils, tables of the approximate composition of the crude oils of the United States, of products obtained from Pennsylvania crude petroleum when distilled destructively, and for comparison of Centigrade and Fahrenheit degrees, as well as wholesale prices current of the various substances used in lubrication. The author calls particular attention to the chapter on "Apparatus for the Examination and Study of the Behavior of Valve and Cylinder Oils and Other Petroleum and Lubricating Oils in Saturated and Superheated Steam, Carbon Dioxide and Other Gases," by P. H. Conradson, Chief Chemist of the Galena-Signal Oil Company, of Franklin, Pa., which he recommends as an experiment of great value on this subject. There is also a short bibliography of the subject at the end of the book. A partial list of Contents is: Specific Gravity; Cold Test; Viscosity; Iodine Absorption; Flush and Fire Test; Acidity; Manmene's Test; Color Reactions of Oils with Nitric and Sulphuric Acids; Separations of Material Oil from a Vegetable or Animal Oil; Gumming Test; Sulphur Test; Test for Water; Gasoline Test; Microscopical Examination; Carbon Residue Test; Fixed Carbon in Oil; etc., etc.

THE "MECHANICAL WORLD" POCKET DIARY AND YEAR-BOOK FOR 1915:

A Collection of Useful Engineering Notes, Rules, Tables and Data. Cloth, 6¼ x 4 in., illus., 439 pp. Manchester and London, England, Emmott & Company, Limited; Baltimore, Md., The Norman, Remington Co., 1915. 50 cents. (Donated by The Norman, Remington Co.)

The preface states that this, the 1915, edition of the Handbook on the mechanical means of transmitting power, has been thoroughly revised and that many new illustrations and features containing matter of value to the engineer, draftsman, etc., have been added. The section on Toothed Gearing has been rewritten and enlarged and now embodies, it is said, much practical data on this subject and also on Gear Cutting. A section on Structural Steel and Iron Work has been substituted for that formerly devoted to Beams and Girders. The section on the Gas Engine has been revised and extended, and new sections on Limit Gauges, Strength of Flat Plates, etc., have been added, together with new tables on Cost of Power, Helix Angles, Morse Tapers, Proportions of T-Slots, etc. A partial list of Contents is: Index; Steam and the Steam Engine; Steam Turbines; Steam Boilers; Gas Engines; Oil Engines; Suction Gas Producers; Structural Iron and Steel Work; Shafting; Toothed Gearing; Indexing on the Universal Milling Machine; Notes on Grinding; etc., etc.

CENTRIFUGAL PUMPS.

By R. L. Daugherty. Cloth, 9½ x 6¼ in., illus., 9 + 192 pp. New York and London, McGraw-Hill Book Company, Inc., 1915. $2.00.

The extensive use and increasing popularity of centrifugal pumping machinery make it necessary, it is stated, for many engineers to familiarize themselves with all phases of the subject. In this book, the author has endeavored, it is said, to

illustrate and explain all the essential features of construction, installation, and operation of the various types of modern centrifugal pumps, as well as their suitability to various services. He also discusses the general theory of the centrifugal pump, its characteristics, factors of efficiency, etc., and presents a comparison of it and the displacement pump, together with the various laws and factors leading to a better appreciation of such pumps and a better means of selecting proper combinations. The subject-matter, it is stated, is based on the author's study of the performances and analyses of tests of turbines and volute centrifugal pumps made by various manufacturers, and although it is not intended as a book on design, it is believed that a thorough study of its contents will be of value to prospective designers, the methods of design of centrifugal pumps being also outlined. It has been written, it is said, to serve the needs of the practicing engineer, but problems and questions have been inserted at the end of each chapter, which it is hoped will make it of equal value as a textbook. The Chapter headings are: Introduction; Description; Installation and Operation; General Theory; Theory of Centrifugal Pumps; Characteristics; Disk Friction; Factors Affecting Efficiency; Centrifugal Pumps *vs.* Displacement Pumps; Comparison of Types of Centrifugal Pumps; General Laws and Factors; Pump Testing; Costs; Rotary and Screw Pumps; Applications of Centrifugal Pumps; Design of a Centrifugal Pump; Appendix A, Test Data; Appendix B, Review Questions; Appendix C, Table of ¾ Powers of Numbers; Index.

HANCOCK'S APPLIED MECHANICS FOR ENGINEERS.

Revised and Rewritten by N. C. Riggs. Cloth, 7½ x 5¼ in., illus., 13 + 441 pp. New York, The Macmillan Company, 1915. $2.40.

In the author's preface to the first edition, it is stated that the subject-matter includes much that is new in the applications of mechanical principles and that the chapters on Couples, Moment of Inertia, Center of Gravity, Work and Energy, and Friction and Impact, are more complete in theory and application than those of any other American textbook on the subject. The volume is intended, it is stated, as a textbook for engineering students of the Junior year, but it is hoped that it may also prove helpful to engineers. The student, it is said, finds much difficulty in applying theory to practical problems, and, therefore, each new principle developed in the text has been followed by problems illustrating such principle. Frequent reference to original sources are also given. In the revised edition, it is said, one important change has been the much larger use of graphical methods, the graphical and analytical methods being developed simultaneously and many of the problems being solved by both methods. The original subject-matter and order of arrangement of the text have been retained, it is stated, but much that is new has been introduced, particularly in the construction of stress diagrams for trusses, the application of equilibrium polygons to centers of gravity of plane areas, to weighted strings and linkages, and to bending moment diagrams, etc. About two hundred new problems have also been added for solution in connection with the principles discussed. The Contents are: Definitions; Concurrent Forces; Parallel Forces; Center of Gravity; Couples; Non-Concurrent Forces; Moment of Inertia; Flexible Cords; Motion in a Straight Line; Curvilinear Motion; Rotary Motion; Work and Energy; Friction; Dynamics of Rigid Bodies; Impact; Appendix I, Hyperbolic Functions; Appendix II, Logarithms of Numbers; Appendix III, Trigonometric Functions; Appendix IV, Conversion Tables; Index.

THE "MECHANICAL WORLD" ELECTRICAL POCKET BOOK FOR 1915:

A Collection of Electrical Engineering Notes, Rules, Tables and Data. Cloth, 6¼ x 4¼ in., illus., 303 pp. Manchester and London, England, Emmott & Company, Limited; Baltimore, Md., The Norman, Remington Co., 1915. 50 cents. (Donated by The Norman, Remington Co.)

This Pocket Book, it is stated, is a companion volume to the "Mechanical World" Pocket Diary and Year Book, and includes a varied collection of electrical data prepared especially for the use of those in charge of electrical plants and machinery. The subject-matter, it is said, has been thoroughly revised and extended and several new sections have been added on Electric Circuits and Switching, Synchronizing, Phasing Out, Alternating Current Generators, Motors, etc. A partial list of Contents is: Index; Electrical Units; Resistance; Electrolysis; Magnets; Magnetic Circuit and Magnetic Materials; Continuous Current Dynamos and Motors; Alternate Current Systems; Alternators; Alternating Current Motors; Alternating Current Generator and Motor Troubles; Transformation of Currents; Motor Starters; Supply Factors; Accumulator Notes; Transmission Conductors and Cables; Conduit System of Wiring; etc., etc.

ELEMENTARY ELECTRICITY AND MAGNETISM:

A Text-Book for Colleges and Technical Schools. By Wm. S. Franklin and Barry Macnutt. Cloth, 7¾ x 5 in., illus., 8 + 174 pp. New York, The Macmillan Company; London, Macmillan & Co., Ltd., 1914. $1.25.

The preface states that the study of electricity and magnetism, as represented in this book, may be properly called electro-mechanics. The subject-matter, as stated in the title, is elementary in character, and is said to show the variant co-relations involved in electric currents, electromotive forces, and the magnetic and electric fields. At the end of each chapter problems in the subjects discussed in that chapter are given. The Chapter headings are: Effects of the Electric Current; Magnetism; Chemical Effect of the Electric Current; The Heating Effect of the Electric Current; Induced Electromotive Force; Electric Charge and the Condenser; Index.

HANDBOOK ON OVERHEAD LINE CONSTRUCTION.

Compiled by the Sub-Committee on Overhead Line Construction, National Electric Light Association. Presented at the Thirty-Seventh Convention, Held at Philadelphia, Pennsylvania, June 1-5, 1914. Roan, 6¾ x 4½ in., illus., 10 + 819 pp. Philadelphia, National Electric Light Association, 1914.

The purpose of this Handbook, as stated in the preface, is the presentation in one volume of descriptions of the methods and materials used in overhead line construction and a tabulation of the necessary formulas for the electrical and mechanical solutions of various transmission and distribution problems. In the discussion of apparatus used for the purpose, efforts have been made, it is said, to describe the various types at present on the market. The Sub-Committee states that this work is not to be considered as a Handbook of rules and regulations, and that no attempt has been made to create standards or write specifications; it is rather a collection of useful information which should prove of material assistance to those engaged in the construction or maintenance of overhead lines for light or power purposes. The Contents are: An Abridged Dictionary of Electrical Words, Terms, and Phrases; Tables; Distribution and Transmission Line Supports; Conductors and Wire Tables; Cross-Arms, Pins and Pole Line Hardware; Insulators; Transformers and Induction Regulators; Systems of Distribution and Transmission; Electrical Calculations; Mechanical Calculations of Transmission and Distribution Lines; Preservative Treatment of Poles and Cross-Arms; Primary and Secondary Line Construction; Meteorological Data; General Data, and Rules for Resuscitation from Electric Shock; Index.

FIELD PRACTICE: AN INSPECTION MANUAL

For Property Owners, Fire Departments, and Inspection Offices, Covering Common Fire Hazards and Their Safeguarding and Fire Protection and Upkeep. 1914 Edition. Roan, 7 x 4¾ in., 199 pp. Boston, National Fire Protection Association, 1914. $1.50.

As stated in the title, this Manual covers the more essential features of the common fire hazards and their safeguarding, the functional principles, as well as the maintenance and upkeep, of fire protection appliances, and the means of fire prevention. It embodies, it is said, in non-technical language, the latest ideas of the leading American fire prevention engineers, and is intended to serve as a guide in these matters for the layman and the inspector. The Contents are: I. Common Fire Hazards and Their Safeguarding: Lighting Hazards; Heating Hazards; Power Hazards; Chemicals, Paints and Oils; Spontaneous Ignition and Dust Explosions; Care and Maintenance; Chimneys and Flues; Dwelling House Hazards: II. Fire Protection and Upkeep (Automatic and Manual): Automatic Sprinkler Installations; Fire Protection in General; Index.

MASONRY:

A Short Text-Book on Masonry Construction, Including Descriptions of the Materials Used, Their Preparation and Arrangement in Structures. By Malverd A. Howe, M. Am. Soc. C. E. Cloth. 9¼ x 6 in., illus., 9 + 160 pp. New York, John Wiley & Sons, Inc.; London, Chapman & Hall, Limited, 1915. $1.50.

The object of this book, it is stated, has been to furnish a concise treatment of masonry construction for use in a short course which includes concrete con-

struction or in a longer course in conjunction with a manual on concrete. Only modern methods of construction are described, it is stated, and modern tools and machinery illustrated. In several chapters, definitions of terms commonly used in connection with the subject discussed are included, and the specifications in Part III are said to give the best modern methods of selecting materials and their use in structures. A detailed bibliography of the subject is also given. The Contents are: Part I, The Materials: Natural Building Stones; Artificial Building Materials. Part II, Masonry: Stone Masonry; Brick and Hollow-Tile Masonry; Concrete Masonry. Part III, Railroad Masonry, Brick, Cement, etc.; References; Index.

THE MECHANICAL PROPERTIES OF WOOD

Including a Discussion of the Factors Affecting the Mechanical Properties, and Methods of Timber Testing. By Samuel J. Record. Cloth, 9¼ x 6 in., illus., 11 + 165 pp. New York, John Wiley & Sons, Inc.; London, Chapman & Hall, Limited, 1914. $1.75.

This book, the preface states, was written primarily for students of forestry to whom a knowledge of the technical properties of wood is essential, but all unnecessary technical terms and descriptions have been avoided, it is said, in an endeavor to make the work available to every one interested in wood. The subject-matter is divided into three parts. In Part I, the author discusses the relation of wood material to stresses and strains and includes numerous tables showing the various strength values of many of the more important American woods. Part II deals, it is said, with the factors affecting the mechanical properties of wood, and the author states that, in this connection, he has attempted to answer such questions as the effect on the quality of wood of rate of growth, season of cutting, heartwood and sapwood, locality of growth, weight, water content, steaming, and defects. In Part III, methods of timber testing, as well as the various machines used in such testing, are described. These methods are stated to be mostly those followed by the United States Forest Service. The Appendix contains a sample working plan followed by the Forest Service in extensive investigations covering the mechanical properties of woods grown in the United States, together with tables of strength values of both green and air-seasoned timbers for structural purposes. There is a detailed bibliography of the important publications and articles on the mechanical properties of wood and timber testing. The Contents are: Part I, The Mechanical Properties of Wood; Part II, The Factors Affecting the Mechanical Properties of Wood; Part III, Timber Testing; Appendix; Bibliography; Index.

PRACTICAL TALKS ON FARM ENGINEERING:

A Simple Explanation of Many Everyday Problems in Farm Engineering and Farm Mechanics Written in a Readable Style for the Practical Farmer. By R. P. Clarkson. Cloth, 7¾ x 5¼ in., illus., 15 + 223 pp. Garden City, N. Y., Doubleday, Page & Company, 1915. $1.00.

The author's aim in this book, it is stated, is to present, in an interesting and popular manner, material gleaned from years of experience spent in aiding and advising farmers on the subject. The subject-matter is said to be a selection from articles, published by the author in prominent farm journals in the United States and Canada, in answer to questions relating to engineering subjects with which the farmer has to deal, such as choice of materials for buildings, roads, walks, and fences, and their construction, water supply, land drainage, sewerage and sewage disposal, power, etc. The text, it is stated, has been thoroughly revised and expanded, and many new illustrations have been added. The Chapter headings are: Farm Buildings and Building Materials; Farm Water Supply and Sewage Disposal; Farm Power; Drainage and Irrigation; Miscellaneous Engineering Talks; Useful Tables for Engineering Calculations; Index.

ELEMENTS OF FORESTRY.

By Frederick Franklin Moon and Nelson Courtlandt Brown. Cloth, 8¼ x 5½ in., illus., 17 + 392 pp. New York, John Wiley & Sons, Inc.; London, Chapman & Hall, Limited; Montreal, Renouf Pub. Co., 1914. $2.00.

The educational awakening that is taking place along forestry lines in the United States has been so remarkable, it is stated, that the authors felt that a textbook, broad in scope and containing general information on all phases of the

subject, was needed for use in agricultural schools and colleges. They have endeavored, therefore, in this volume to supply such need. Their chief object has been, it is said, to gather data on the subject from sources not readily available and to present them in a form easily grasped by the student. An especial effort has been made, it is said, to make the book useful to teachers without a forestry degree who are engaged in agricultural work, and it is hoped that the bibliographies at the end of each chapter will prove of particular interest to them. Many details in regard to the forest regions, which can be supplied by individual instructors, have been omitted, it is stated, as well as a chapter on Dendrology which is thought to be too large a subject for a general textbook. The Appendix contains tables of log rules, volume, yield, rate of growth, etc., sample tally sheets for use in estimating and stem analysis, etc., and a Glossary of terms used in Forestry is also included. The Chapter headings are: Introduction; The Tree; Silvics; Silvicultural Systems of Management; Improvement Cutting; Artificial Regeneration; Forest Protection; Forest Mensuration; Lumbering; Wood Utilization; Wood Technology; Wood Preservation; Forest Economics; Forest Finance; Regional Studies; Northern Forest; Southern Pines; Central Hardwoods; Prairie or Fringe Forest; Northern Rocky Mountain Forest; Southern Rocky Mountain Forest; Pacific Coast Forest; Appendix; Glossary; Index.

HISTORY OF RENSSELAER POLYTECHNIC INSTITUTE, 1824-1914.

By Palmer C. Ricketts, M. Am. Soc. C. E. Cloth, 8¾ x 6 in., illus., 12 + 269 pp. New York, John Wiley and Sons; London, Chapman & Hall, Limited, 1914. $2.50. (Donated by the Author.)

The first edition of this book was published in 1895, and in the preface to that edition, the author states that because the official publications relating to the Institute from the time of its founding had become rare, he had determined to publish a short history of the school which should consist largely of a description of the development of its curriculums. The Institute was founded, it is stated, at Troy, N. Y., in 1824, by Stephen Van Rensselaer, of Albany, N. Y., under the name of the Rensselaer School, for the purpose of teaching the "application of science to the common purposes of man" and was the third school of its kind in any English-speaking country and the first which has had a continuous existence. As stated, this volume contains detailed information of the Institute, its founders, different courses, equipment, methods, etc., including a history of its curriculums, from its founding in 1824 to 1914. The Contents are: The Foundation of the School; Stephen Van Rensselaer and Amos Eaton; Act of Incorporation and Early By-Laws; Methods of Instruction, Preparation Branch Established; Name Changed to Rensselaer Institute, Removal to the Van der Heyden Mansion; Establishment of the Department of Civil Engineering; Reorganization of the School: The Rensselaer Polytechnic Institute; Destruction by Fires, More Land and New Buildings, Athletics; Russell Sage, Mechanical and Electrical Courses, Graduate Courses, '87 Gymnasium; Alumni and Student Organizations, Publications, Statistics of Graduates; Present-Day Equipment and Methods, Statistics of Students; Bibliography; Appendices; Index.

CIVIL ENGINEERING SPECIFICATIONS AND CONTRACTS.

By Richard I. D. Ashbridge, M. Am. Soc. C. E. Cloth, 8½ x 5½ in., illus., 186 pp. Chicago, American Technical Society, 1914. $1.00. (Donated by the Author.)

In an engineering work, the author states, it is important that the interested parties consider what is to be done, how it is to be done, and what it is going to cost. To this end the engineer, it is said, must set forth his ideas by drawings and written descriptions or specifications, make estimates of cost under various methods of construction, prepare the form of bid or proposal, and, later, must adopt a form of articles of agreement and fix a bond which, with the specifications, drawings and proposal, form the contract. These various steps are treated in this book, it is stated, in the order of their importance in the contract from the engineer's point of view. The author has endeavored, it is said, to develop a logical system of preparing specifications and to present a method of avoiding mistakes and omissions that are common to such work. All types of specifications for railroad work, bridges, culverts, excavations, fills, tunnels and roadbeds, and country and city paving, have been covered, it is said, and proposals, agreements, and contract forms have also been discussed, together with points to be considered and avoided in drawing up a set of specifications and in the proper drafting of a contract. The Contents are: Introduction; General Instructions; General Provisions; Typical Illustrative Specifications; Contract or Articles of Agreement; Proposals; Advertisement; Practice in Specification and Contract Writing; Index.

ENGINEERING OFFICE SYSTEMS AND METHODS,

Together with Schedules and Instructions for the Collection of Preliminary Data for Engineering Projects; Sampling, Inspecting and Testing Engineering Materials; Conducting Domestic and Export Shipping Operations, etc. By John P. Davies, Assoc. M. Am. Soc. C. E. Cloth, 9¼ x 6¼ in., illus., 16 + 544 pp. New York and London, McGraw-Hill Book Company, Inc., 1915. $5.00 (Donated by the Author.)

The subject-matter contained in this book had its inception, the preface states, in a collection of such "reminders" as is commonly used in engineering offices for checking drawings and specifications, together with matter relating to engineering office routine, extracts from articles in periodicals, catalogues, and engineering books relating to the general subject of engineering office systems. As stated in the secondary title, the author has discussed the collection of preliminary data for engineering projects, including foundation testing, stream gauging, engineering designs and drawings, specification writing, quotations on standard materials for plant, machinery, materials of construction, etc., purchasing methods, cost keeping and estimating, progress charts, scheduling systems, etc., indexing and filing systems, drawing-room systems and methods, abbreviations, fees, contract forms, etc. The Chapter headings are: Collection of Preliminary Data for Engineering Projects; Designing and Drafting Systems; Specifications for Engineering Material; Reminders for Obtaining Quotations on Standard Material; Purchasing-Office Methods and Forms; Cost Keeping and Estimating; Sampling, Inspecting and Testing Engineering Material; Domestic Shipping; Export Shipping; Progress Charts, Scheduling Systems, etc.; Indexing and Filing Systems, etc., for the Engineering Office; Drawing-Office Systems and Methods; Miscellany; Index.

CONCRETE STONE MANUFACTURE.

By Harvey Whipple. Roan, 7 x 4¼ in., illus., 255 pp. Detroit, Concrete-Cement Age Publishing Co., 1915. $1.00.

The development of factory-made concrete units, the preface states, has not kept pace with that of field-made concrete in the mass, and this is due, the author asserts, to the fact that many individual enterprises have not had adequate managerial and mechanical equipment. A proper development of concrete stone manufacture depends, it is said, on a study of the market, on skillful workmanship, economical operation, adequate equipment, and competent management, and these objectives, it is stated, are considered in detail in this book which it is hoped will lend impetus and direction to an important industrial growth. In Chapter 10, the author has given descriptions of the layout and equipment of eleven commercially operated factories engaged in the industry, together with plans, specifications, and costs, which chapter is intended as an aid to the manufacturer who is planning to erect and equip a new plant. The Contents are: The Development of Concrete Building Units; Location, Equipment, Layout; Materials, Mixtures, Manipulation; Curing; Special Molds and Patterns; Surfaces; Shop Records and Cost Keeping; Building Regulations, Tests, Specifications; Selling the Products; Examples of Layout and Operation; Index.

Gifts have also been received from the following:

Am. Elec. Ry. Assoc. 6 bound vol.
Am. Inst. of Min. Engrs. 1 vol.
Am. Soc. of Mech. Engrs. 1 bound vol.
Am. Telephone & Telegraph Co. 1 vol., 7 pam.
Ammons, E. M. 2 bound vol.
Amsterdam, N. Y.-City Clerk. 3 vol.
Arizona-Corporation Comm. 1 bound vol.
Assam, India-Supt. of Public Works. 1 pam.
Assoc. of Transportation and Car Accounting Officers. 1 pam.
Attleborough, Mass.-Water Dept. 1 pam.
Auburn, N. Y.-Water Board. 1 pam.
Baltimore & Ohio Chicago Terminal R. R. Co. 3 pam.
Baltimore County, Md.-Roads Engr. 3 pam.
Barry Ry. Co. 1 pam.
Binghamton, N. Y.-Water Commrs. 1 pam.
Boston, Mass.-Dept. of Public Works. 1 bound vol.
British Columbia-Water Rights Branch. 1 pam.
Brockton, Mass.-Water Commrs. 1 pam.
Brookline, Mass.-Water Board. 1 pam.
Buffalo, N. Y.-Dept. of Health. 3 pam.
Buffalo, N. Y.-Dept. of Public Works. 2 vol.
Buffalo & Susquehanna R. R. Corporation. 1 pam.
Bureau of Ry. Economics. 4 pam.
Burlington, Vt.-City Clerk. 1 bound vol.
Burlington, Vt.-Water Dept. 1 pam.
Caledonian Ry. Co. 4 pam.
California-State Dept. of Weights and Measures. 1 pam.

California-State Forester. 1 pam.
Cambrian Rys. Co. 1 pam.
Canada-Dept. of Marine and Fisheries. 1 pam.
Canada-Dept. of Mines. 2 vol., 1 pam.
Canada-Minister of the Interior. 1 bound vol.
Carnegie Endowment for International Peace. 1 pam.
Century Assoc. 1 bound vol.
Chicago, Ill.-Bureau of Eng. 1 pam.
Chicago, Ill.-Civ. Service Comm. 1 bound vol.
Chicago, Ill.-Municipal Reference Library. 1 vol., 4 pam.
Chicago, Milwaukee & St. Paul Ry. Co. 3 pam.
Colorado-State Agricultural Coll. 1 pam.
Concord, Mass.-Water and Sewer Dept. 1 pam.
Connecticut-Public Utilities Comm. 1 bound vol.
Dayton, Ohio-Bureau of Municipal Research. 1 pam.
Delaware Coll. 1 vol.
Delaware, Lackawanna & Western R. R. Co. 1 pam.
Dooling, Peter J. 1 bound vol.
Dover, N. H.-Water Commrs. 1 pam.
Duluth, Minn.-Water and Light Dept. 1 pam.
Engrs. Club of New York. 1 bound vol.
Fairmount Park Art Assoc. 1 pam.
Fetherston, J. T. 2 pam.
Fitchburg, Mass.-City Engr. 1 pam.
Furness Ry. Co. 1 pam.
Glasgow & South-Western Ry. Co. 1 pam.
Great Central Ry. Co. 1 pam.
Great North of Scotland Ry. Co. 7 pam.
Great Western Ry. Co. 2 pam.
Hartford, Conn.-Board of Water Commrs. 1 pam.
Harvard Univ. 2 vol.
Haverhill, Mass.-City Engr. 1 pam.
Hawaii-Governor. 1 pam.
Hawaii-Public Utilities Comm. 2 pam.
Hawaii-Territorial Board of Health. 1 pam.
Huntingdon & Broad Top Mountain R. R. & Coal Co. 3 pam.
Illinois-State Geol. Survey. 1 bound vol.
Illinois Central R. R. Co. 8 pam.
Illinois, Univ. of. 1 pam.
Illinois, Univ. of-Eng. Exper. Station. 1 bound vol.
Indiana-State Board of Forestry. 1 bound vol.
Indiana-State Library. 1 pam.
Iowa, Univ. of. 3 pam.
Janesville, Wis.-City Clerk. 2 pam.
Kanawha & Michigan Ry. Co. 3 pam.
Keene, N. H.-City Clerk. 3 bound vol.
Kentucky-Geol. Survey. 1 bound vol., maps.
Kentucky-State Board of Equilization. 2 pam.
Land Grant Coll. Eng. Assoc. 1 vol.
Lea, S. H. 1 pam.
Leominster, Mass.-Supt. of Water-Works. 1 pam.
Lewis, Nelson P. 1 bound vol.
Little Falls, N. Y.-City Clerk. 1 pam.
Lochridge, E. E. 1 pam.
London & North Western Ry. Co. 1 pam.
Long Island R. R. Co. 1 pam.
Louisiana Eng. Soc. 1 pam.
Louisville, Henderson & St. Louis Ry. Co. 3 pam.
Maine-Dept. of Vital Statistics. 1 bound vol.
Manistee & North-Eastern R. R. Co. 2 pam.
Maryland-State Roads Comm. 2 pam.
Maryport & Carlisle Ry. Co. 1 pam.
Massachusetts-Bureau of Statistics. 1 bound vol.
Massachusetts-State Dept. of Health. 1 bound vol.
Metropolitan Ry. Co. 1 pam.
Michigan-Geol. and Biological Survey. 3 bound vol.
Midland & South-Western Junction Ry. Co. 1 pam.
Mining and Engineering World. 2 bound vol.
Minnesota-State Forest Service. 1 pam.
Minnesota-State Highway Comm. 1 vol.
Missouri-Bureau of Geology and Mines. 1 pam.
Missouri, Kansas & Texas Ry. Co. 3 pam.
Montana-R. R. Comm. 1 map.
Montana-State Engr. 1 vol.
Montreal, Que.-City Clerk. 1 bound vol.
Morgan Eng. Co. 1 pam.
Municipal Engrs. of the City of New York. 1 pam.
National Assembly of Civ. Service Commrs. 1 pam.
National Fire Protection Assoc. 3 pam.
Nebraska-State Engr. 2 bound vol.
New Bedford, Mass.-Water Board. 1 pam.
New Hampshire-Public Service Comm. 2 pam.
New Jersey-Board of Equalization of Taxes. 1 pam.
New Jersey-Geol. Survey. 1 pam.
New York City-Dept. of Finance. 1 vol.
New York State-Public Service Comm., First Dist. 1 bound vol.
New York State-Public Service Comm., Second Dist. 7 pam.
New York-State Comm. of Highways. 1 pam.
New York, New Haven & Hartford R. R. Co. 2 pam.
New York, Susquehanna & Western R. R. Co. 2 pam.
New York Univ. 1 vol.
Newcastle & Gateshead Water Co. 1 pam.
North Carolina-Geol. and Economic Survey. 1 vol.
North Dakota-State Engr. 1 pam.
North Dakota Soc. of Engrs. 1 vol.
North Dakota, Univ. of. 1 vol.
North London Ry. Co. 1 pam.
Northern Central Ry. Co. 3 pam.
Nova Scotia-Commr. of Public Works and Mines. 1 vol.
Old Colony R. R. Co. 3 pam.
Ontario, Canada-Minister of Public Works. 8 vol.
Pacific Coast Co. 2 pam.
Parsons, Barclay & Klapp. 1 bound vol.
Pennsylvania-Bureau of Statistics and Information. 1 bound vol.
Pennsylvania-Public Service Comm. 12 pam.

Pennsylvania-Water Supply Comm. 1 bound vol.
Pennsylvania R. R. Co. 2 pam.
Pennsylvania, Univ. of. 1 vol.
Philadelphia, Baltimore & Washington R. R. Co. 3 pam.
Pittsburgh, Pa.-Carnegie Library. 1 pam.
Polytechnic Inst. of Brooklyn. 1 pam.
Portsmouth, Va.-City Clerk. 1 pam.
Quebec, Canada-Dept. of Mines. 2 vol.
Quebec Central Ry. Co. 2 pam.
Queensland, Australia-Intelligence and Tourist Bureau. 1 vol.
Reading, Mass.-Water Dept. 1 pam.
Rhode Island-Factory Insp. 1 pam.
Rio Grande Southern R. R. Co. 2 pam.
Rochester, N. Y.-City Engr. 2 vol.
Rutgers Coll. 7 vol.
Schiffbautechnischen Gesellschaft. 1 bound vol.
Seaboard Air Line Ry. Co. 2 pam.
Shoreditch Borough (London), England-Town Clerk. 1 bound vol.
Smithsonian Institution. 2 pam.
Soc. of Engrs. 1 bound vol.
Soc. of Municipal Engrs. of the City of Philadelphia. 1 pam.
Soc. of Naval Archts. and Marine Engrs. 1 pam.
South Dakota-Board of R. R. Commrs. 1 bound vol.
Spear, Walter E. 1 pam.
Spokane, Wash.-City Clerk. 1 pam.
Springfield, Ill.-Commr. and Insp. of Bldgs. 1 pam.
Springfield, Mass.-Board of Water Commrs. 1 pam.
Sydney, New South Wales-Harbour Trust Commrs. 1 pam.
Sydney Univ. Eng. Soc. 1 bound vol.
Taff Vale Ry. Co. 1 pam.
Texas, Univ. of. 1 pam.
Thomas, W. M. 1 pam.
Tonopah & Goldfield R. R. Co. 2 pam.
Toronto, Hamilton & Buffalo Ry. Co. 1 pam.
Union Pacific R. R. Co. 3 pam.
U. S.-Board of Ordnance and Fortification. 1 pam.
U. S.-Bureau of Construction and Repair. 4 pam.
U. S.-Bureau of Corporations. 1 pam.
U. S.-Bureau of Education. 1 bound vol.
U. S.-Bureau of Mines. 5 pam.
U. S.-Bureau of Navigation. 8 pam.
U. S.-Bureau of Standards. 11 pam.
U. S.-Bureau of Steam Eng. 1 pam.
U. S.-Bureau of the Census. 1 pam., 1 bound vol.
U. S.-Commr. of Navigation. 5 bound vol.
U. S.-Dept. of Agriculture. 2 pam.
U. S.-Dept. of State. 1 pam.
U. S.-Naval Observatory. 1 bound vol.
U. S.-Navy Dept. 2 vol.
U. S.-Office of Exper. Stations. 1 pam.
U. S.-Pneumatic-Tube Postal Comm. 1 pam.
U. S.-Reclamation Service. 3 pam.
U. S.-War Dept. 2 pam.
U. S.-Weather Bureau. 1 bound vol.
United States Cast Iron Pipe & Foundry Co. 1 bound vol.
United States Steel Corporation. 1 pam.
Universidad Nacional de la Plata. 1 pam.
Vandalia R. R. Co. 8 pam.
Virginia, Univ. of. 1 vol.
Washington-Industrial Welfare Comm. 1 vol.
Washington-Secy. of State. 1 pam.
West Virginia-Geol. Survey. 1 bound vol., maps.
Western Australia-Commr. of Rys. 1 pam.
Wilmington, Del.-Board of Water Commrs. 1 vol.
Wisconsin, Univ. of-Eng. Exper. Station. 1 pam.
Yale Univ. 1 vol.

BY PURCHASE

Handbuch für Eisenbetonbau. Von F. von Emperger. Elfter Band, Gebäude für Besondere Zwecke, I: Zweite Auflage, Markthallen, Schlacht-u. Viehhöfe; Saal-u. Versammlungsbauten Schornsteine; Fabrikgebäude u. Lagerhäuser; Geschäftshäuser. Von V. Lewe und anderen. Berlin, 1915.

Handbuch der Ingenieurwissenschaften: Dritter Teil, Der Wasserbau: Dritter Band, Die Wasserversorgung der Städte. Von O. Smreker. Fünfte, neu bearbeitete Auflage. Leipzig und Berlin, 1914.

Das Grundwasser, seine Erscheinungsformen, Bewegungsgesetze und Mengenbestimmung. Von O. Smreker. Leipzig und Berlin, 1914.

Transactions of the Institution of Mining and Metallurgy. Twenty-third Session, 1913–14. Vol. 23. Edited by S. Herbert Cox, William Gowland, and C. McDermid. London, 1914.

Forschungsarbeiten auf dem Gebiete des Ingenieurwesens. Herausgegeben vom Verein Deutscher Ingenieure. Hefte 165–169. Berlin, 1914.

Sanitary Refrigeration and Ice Making. By J. J. Cosgrove. Pittsburgh, 1914.

Illinois State Geological Survey. Monograph 1: The Mississippian Brachiopoda of the Mississippi Valley Basin. By Stuart Weller. Urbana, 1914.

Deutscher Ausschuss für Eisenbeton. Hefte 27–28. Berlin, 1914.

Transactions of the American Foundrymen's Association. Proceedings of the Nineteenth Annual Meeting, Held at Chicago, Ill., September 7th to 11th, 1914. Vol. 23. Edited by A. O. Backert. Cleveland, Ohio, 1915.

Hydraulics and Its Applications. By A. H. Gibson. New Edition, Revised and Enlarged. New York, 1914.

Design in Landscape Gardening. By Ralph Rodney Root and Charles Fabiens Kelley. New York, 1914.

Stau bei Flussbrücken: Begründung einer neuen Stauformel. By A. Hofmann. Stuttgart, 1913.

Mining Costs of the World: A Compilation of Cost and Other Important Data on the World's Principal Mines. By Edmond Norton Skinner and H. Robinson Plate. New York and London, 1915.

SUMMARY OF ACCESSIONS

(From March 2d to April 3d, 1915)

Donations (including 21 duplicates)	384
By purchase	15
Total	399

MEMBERSHIP

(From March 5th to April 8th, 1915)

ADDITIONS

MEMBERS		Date of Membership.
ANDERSON, EMANUEL. Care, Sargent & Lundy, 1412 Edison Bldg., Chicago, Ill		Oct. 7, 1914
BILGER, HARRY EDMUND. Road Engr., Illinois State Highway Dept., 714 South State St., Springfield, Ill	Assoc. M. M.	Aug. 31, 1909 Mar. 2, 1915
BUSH, ADAM LEONARD. Chf. Engr., Parkinson & Bergstrom, 1035 Security Bldg., Los Angeles, Cal	Assoc. M. M.	Oct. 4, 1910 Mar. 2, 1915
COOMER, ROSS MILLER. Engr. and Contr. (Coomer & Small), 212 United Bank Bldg., Sioux City, Iowa	Assoc. M. M.	Nov. 4, 1908 Mar. 2, 1915
DEGRAFF, HARRY WESTBROOK. Field Supt. of Constr., Am. Pipe & Constr. Co., 20 Market St., Amsterdam, N. Y	Assoc. M. M.	Jan. 3, 1906 Mar. 2, 1915
GILKEY, THOMAS ALVIN. Cons. Engr., 318 Mercantile Bldg., New Castle, Pa	Assoc. M. M.	Oct. 3, 1900 Mar. 2, 1915
GREENE, CARLETON. Cons. Engr. (Greene & Greene), 11 Broadway, New York City	Assoc. M. M.	Mar. 3, 1897 Mar. 2, 1915
JACOBS, JULIUS LILIEN. Res. Mgr., James Stewart & Co., Inc., 214 First National Bank Bldg., Houston, Tex	Jun. Assoc. M. M.	Sept. 1, 1908 Feb. 28, 1911 Mar. 2, 1915
MUSSON, CHARLES AUGUSTIN WOODLEY. Asst. Engr., C., M. & St. P. Ry., 516 State Savings Bank Bldg., Butte, Mont	Assoc. M. M.	Sept. 5, 1911 Mar. 2, 1915
PROCTOR, RALPH FENNO. Chf. Engr., Maryland Casualty Co., Baltimore, Md	Jun. Assoc. M. M.	June 3, 1902 Oct. 4, 1905 Mar. 2, 1915
REEVES, FRANK. Chf. Engr., Buenos Aires & Pacific Ry., Calle Florida 783, Buenos Aires, Argentine Republic		Jan. 6, 1915
REIMER, FREDERIC ADAMS. County Engr., Essex County, Court House, Newark (Res., 51 North Maple Ave., East Orange), N. J	Assoc. M. M.	April 6, 1909 Mar. 2, 1915
RIGGS, THOMAS, JR. Member, Alaskan Eng. Comm., Dept. of the Interior, Washington, D. C	Assoc. M. M.	April 6, 1909 Mar. 2, 1915
SEELYE, ELWYN EGGLESTON. Cons. Structural Engr., 101 Park Ave., New York City	Assoc. M. M.	April 30, 1912 Mar. 2, 1915
WEILAND, ADELBERT ALONZO. Chf. Engr., The Arkansas Val Ditch Assoc.; Cons. Engr., 717 Thatcher Bldg., Pueblo, Colo	Assoc. M. M.	April 6, 1909 Mar. 2, 1915

MEMBERS (*Continued*)

		Date of Membership.
WILSON, JOHN. Member, Board of Water Engrs., State of Texas, Capital Station, Austin, Tex		Mar. 2, 1915
WILSON, THAD LOREN. Senior Asst. Div. Engr., Public Service Comm., First Dist., 233 Broadway, Room 1244 (Res., 1053 Westchester Ave.), New York City	Assoc. M. M.	July 10, 1907 Mar. 2, 1915

ASSOCIATE MEMBERS

BAINE, GEORGE FREDSON. Asst. Engr., Buenos Aires West. Ry., Care, Oficina del Subterraneo, F. C. O., 2961 B. Mitre, Buenos Aires, Argentine Republic		Jan. 6, 1915
BARKER, JAMES MADISON. Instr. in Civ. Eng., Graduate School of Applied Science, Harvard Univ.; Instr. in Civ. Eng., Mass. Inst. Tech., Boston, Mass	Jun. Assoc. M.	Oct 1, 1907 Mar. 2, 1915
BEAR, ERNEST RUBY. 8 Walnut Ave., Woodlawn, Wheeling, W. Va		Mar. 2, 1915
BEEBE, JOHN CLEAVELAND. Power and Pumping Engr., Idaho Irrig. Co., Ltd., Richfield, Idaho	Jun. Assoc. M.	Nov. 1, 1910 Mar. 2, 1915
BRINGHURST, JOHN HENRY. Instr. in Civ. Eng., Univ. of Michigan, 1234 Prospect St., Ann Arbor, Mich	Jun. Assoc. M.	Jan. 3, 1911 Mar. 2, 1915
CONLON, FRANK JOSEPH. Asst. Engr., Bureau of Sewers, 577[a] Macon St., Brooklyn, N. Y		Mar. 2, 1915
CRITCHLOW, HOWARD THOMPSON. Asst. Engr., Water Supply Comm. of Pennsylvania, Harrisburg, Pa	Jun. Assoc. M.	Jan. 2, 1912 Dec. 2, 1914
DAVIS, ROBERT MENEES. U. S. Junior Engr., 2530 Sunset Ave., Bakersfield, Cal		Mar. 2, 1915
DOHM, EDWARD CLARENCE. State Field Engr. and Chf. Engr., Dept. of Public Lands, Box 234, Olympia, Wash		Jan. 6, 1915
DONALDSON, CARL S. City Engr., Beaver Falls, Pa		Mar. 2, 1915
DUNLAP, WALTER HANNA. Care, Bureau of Applied Economics, 711 Southern Bldg., Washington, D. C	Jun. Assoc. M.	Oct. 31, 1911 Jan. 6, 1915
FEREBEE, JAMES LUMSDEN. Prin. Asst. Engr., Milwaukee Sewerage Comm., City Hall, Milwaukee, Wis		Mar. 2, 1915
GRAM, RALPH SAMUEL. Asst. Engr., Board of Education, 2304 Maplewood Ave., Toledo, Ohio	Jun. Assoc. M.	Mar. 3, 1908 Mar. 2, 1915
HALSTEAD, GEORGE ELIAS. Res. Engr. in Chg. of Constr., Wabash River Bridge and Levee Impvt., LaFayette (Res., 202 Fowler Ave., West Lafayette), Ind	Jun. Assoc. M.	June 30, 1911 Mar. 2, 1915

ASSOCIATE MEMBERS (*Continued*)

		Date of Membership.
HAMLIN, HORACE PARLIN. Designing Engr., Raymond Concrete Pile Co., 140 Cedar St., New York City	Jun.	June 6, 1905
	Assoc. M.	Mar. 2, 1915
HOWES, HERBERT ELLSWORTH. Asst. Engr., St. Anthony Falls Water Power Co., 1316 Seventh St., S. E., Minneapolis, Minn		Mar. 2, 1915
HUGHES, CHARLES REGINALD. Dist. Engr., Erie R. R., 304 Cincinnati Blk., Lima, Ohio		Mar. 2, 1915
HYER, CHARLES JACOB. Engr. and Contr. (McGucken & Hyer), Box 1052, Tampa, Fla	Jun.	July 9, 1912
	Assoc. M.	Mar. 2, 1915
KING, WESLEY EUGENE. 1410 Pioneer Bldg., St. Paul, Minn.		Mar. 2, 1915
PHILBRICK, BENJAMIN SIMPSON. Res. Engr., Mexico Northern Power Co., Santa Rosalia, Chih., Mexico		Mar. 2, 1915
ROWE, WILFRED LINCOLN. Asst. Engr., U. S. Reclamation Service, Meadow Creek, Wash	Jun.	Mar. 31, 1908
	Assoc. M.	Mar. 2, 1915
SCALES, GEORGE CHESTER. Senior Highway Engr., U. S. Office of Public Roads, 701 North Boulevard, Atlanta, Ga		Oct. 7, 1914
SCHEIN, NATHAN. Asst. Engr., Bureau of Eng., 1510 Carson St., Pittsburgh, Pa		Mar. 2, 1915
SELMER, WILLIAM LEE. Asst. Engr., Public Service Comm., First Dist., 30 East 128th St., New York City	Jun.	Mar. 31, 1908
	Assoc. M.	Mar. 2, 1915
SEYMOUR, HORATIO. Sagamore Rd., Bronxville, N. Y.	Jun.	April 2, 1913
	Assoc. M.	Mar. 2, 1915
SMITH, JAMES ELMO. Asst. Prof. of Civ. Eng., Univ. of Illinois, 805 Indiana Ave., Urbana, Ill		Mar. 2, 1915
SMITH, JULIEN. City Engr., Selma, Ala		Mar. 2, 1915
STRATE, THOMAS HENRY. Room 16, C., M. & St. P. Station, Aberdeen, S. Dak		Mar. 2, 1915
STREETER, HAROLD WARNER. San. Engr., U. S. Public Health Service, 3534 Stacey Ave., Cincinnati, Ohio		Mar. 2, 1915
STUETZEL, CARL, JR. Engr. and Supervisor of Plans, Bldg. Dept., City of Boston, 20 Montview St., West Roxbury, Mass		Mar. 2, 1915
STURT, GEORGE ELIOTT. Junior Engr., U. S. War Dept., 315 Peck St., Sault Ste. Marie, Mich		Mar. 2, 1915
SUN, TAOYUH CLARANCE. Managing Director, Nanking-Hunan Ry., Nanking, China	Jun.	Oct. 4, 1910
	Assoc. M.	Dec. 2, 1914
THURLOW, OSCAR GOWEN. Designing Engr., Alabama Power Co., Birmingham, Ala		Mar. 2, 1915
TURNER, ARTHUR JOHN. Supt. of Constr., Washington Water Power Co., Long Lake, Wash		Mar. 2, 1915

ASSOCIATES

		Date of Membership.
MORRISON, ROGER LEROY. Prof. of Highway Eng., Agricultural and Mechanical Coll. of Texas, College Station, Tex.....	Jun.	April 4, 1911
	Assoc.	Mar. 2, 1915

JUNIORS

ALTMAN, FRANK STORK. City Engr., Atchison, Kans.....	Mar. 2, 1915
BRYSON, CARLYLE HUGO. City Engr., Lima, Ohio.....	Mar. 2, 1915
HAMMOND, LEWIS MERRICK. Asst. Engr., U. S. Reclamation Service, Provo, Utah.....	Mar. 2, 1915
HAUKE, CHARLES ROYCE. Asst. Engr., U. S. Indian Irrig. Service, Fort Belknap Agency, Harlem, Mont.....	Oct. 7, 1914
KREFELD, WILLIAM JOHN. 74 West 102d St., New York City.....	Mar. 2, 1915
LESTER, HOMER ALLAN. Care, N. & W. Ry., Charlotte Court House, Va.....	Dec. 2, 1914
MORRIS, SAMUEL BROOKS. Chf. Engr., Pasadena Water Dept., 72 North Fair Oaks Ave., Pasadena, Cal.....	Mar. 2, 1915
ROBINSON, RUSSELL MOORE. Topographical Draftsman, Morgan Eng. Co., Dayton, Ohio.....	Mar. 2, 1915
SCHULTZ, HAROLD AUGUST HASTRUP. Structural Engr., Constr. Dept., Ford Motor Co., 148 Davison Ave., Detroit, Mich.....	Mar. 2, 1915
WEBER, CHARLES MARIA. 704 Stewart Ave., Ithaca, N. Y..	Mar. 2, 1915
WESTENHOFF, ALPHONSE MUELLER. Insp., Structural Div., Eng. Dept., City of Cincinnati, 2621 Fenton Ave., Cincinnati, Ohio.....	Mar. 2, 1915
WILLCOX, HENRY. Draftsman, Turner Constr. Co., West New Brighton, N. Y.....	Mar. 2, 1915

CHANGES OF ADDRESS

MEMBERS

ARMSTRONG, WALTER ROOT. Gen. Mgr. and Chf. Engr., Salt Lake & Utah R. R., Room 704, Newhouse Bldg., Salt Lake City, Utah.

BAKER, CHARLES HINCKLEY. Vice-Pres., Am. Cyanamid Co.; Vice-Pres., Muscle Shoals Hydro-Elec. Co.; Pres., Palm Beach & Everglades R. R., Mohegan Lake, N. Y.

BAKER, HOLLAND WILLIAMS. U. S. Asst. Engr., 94 North High St., Chillicothe, Ohio.

BISHOP, HUBERT KEENEY. Fairport, N. Y.

BLOOM, J GEORGE. Valuation Dept., C., R. I. & P. Ry., Room 1125, La Salle St. Station, Chicago, Ill.

BREED, HENRY ELTINGE. First Deputy Commr., State Highway Comm., Albany, N. Y.

BROSIUS, ALBERT MARSHALL. Care, E. L. Buck, 1003 Park Ave., Minneapolis, Minn.

MEMBERS (*Continued*)

BROWN, WALTER HENRY. Hydr. Engr., 701 Post St., San Francisco, Cal.
BUEL, ALBERT WELLS. 15 William St., New York City.
BURDEN, JAMES. Res. Engr., New York State Barge Canal, Utica, N. Y.
CAMERON, HARRY FRANK. Acting Chf. Constr. Engr., Bureau of Public Works, Manila, Philippine Islands.
CLASS, CHARLES FRANK. Reinforced Concrete and Structural Engr., Union Trust Bldg., Harrisburg, Pa.
CLAYTON, ROBERT MORRIS. Cons. Engr., 244 Capitol Ave., Atlanta, Ga.
CURTIS, CHARLES ELBERT. 1953 East 116th St., Cleveland, Ohio.
DAVIS, GEORGE HENRY. (Ford, Bacon & Davis), 921 Canal St., New Orleans, La.
DOWNS, LAWRENCE ALOYSIUS. Supt., Ill. Cent. R. R., Louisville, Ky.
FARLEY, PHILIP PATRICK. 1377 Carroll St., Brooklyn, N. Y.
FITCH, CHARLES LINCOLN. 309 Whitney Central Bldg., New Orleans, La.
FORTIN, SIFROY JOSEPH. Chf. Engr.'s Branch, Public Works Dept., Ottawa, Ont., Canada.
GAULT, HOMER JOHNSTON. Engr., U. S. Reclamation Service, El Paso, Tex.
GOETHALS, GEORGE WASHINGTON. Col., Corps of Engrs., U. S. A.; Governor, The Panama Canal, Balboa Heights, Canal Zone, Panama.
HANNA, FRANK WILLARD. Cons. Engr., U. S. Reclamation Service, Ankeny, Iowa.
HOAG, SIDNEY WILLETT, JR. 201 West 117th St., New York City.
HORNSBY, ROBERT WRIGHT. Cons. Engr., Casilla 1530, Valparaiso, Chili.
IDE, WILLIAM STONE. 22 Forest St., Providence, R. I.
JOHNSON, FRANCIS ROBERT. Care, G. I. P. Ry., Multai, Central Provinces, India.
KIMBALL, JOSEPH HARRIS. Hydr. Engr. with Morgan Eng. Co., City National Bank Bldg., Dayton, Ohio.
KING, PAUL SOUBIN. 701 West 10th St., Wilmington, Del.
LAURGAARD, OLAF. Cons. Engr., 410 Ry. Exchange Bldg., Portland, Ore.
LEE, GEORGE ALLEN. Chf. Engr., Bluff Harbour Board, Bluff, New Zealand.
LESTER, WILLIAM JUNIUS. Care, Parkview Hotel, Tenth and Paseo, Kansas City, Mo.
MALTBY, FRANK BIERCE. Care, F. D. Rugg, Champaign, Ill.
MILLER, FRANK. Cons. Engr. (Long & Miller), 13 Park Row, New York City.
MOISSEIFF, LEON SOLOMON. 3 East 106th St., New York City.
MOORE, JAMES EDWIN ALEXANDER. Civ. and Mech. Engr. (Marani & Moore), 1900 Euclid Bldg., Room 702, Cleveland, Ohio.
PEARSON, EDWARD JONES. First Vice-Pres., Tex. & Pac. Ry., Whitney Central Bldg., New Orleans, La.
PIERCE-HOPE, JOHN. Chf. Engr., Land Dept., Caixa No. 53, Corumba (*via* Rio Janiero), Brazil.
REAL Y GAILLARD, JUAN D. Vista Alegre, Santiago de Cuba, Cuba.
RICKER, GEORGE ALFRED. Cons. Engr., 188 State St., Albany, N. Y.
ROBERTSON, DAVID. R. F. D. 1, Putnam, Conn.

MEMBERS (*Continued*)

SCHULTZE, PAUL. Cons. Engr., 33 Douw Bldg., Albany, N. Y.

SHMELEFF, THEODOR SEMENOVITCH. Cons. Engr., Novorossiisk, Caucasus, Russia.

SIMPSON, GEORGE HUME. 434 Shady Ave., E. E., Pittsburgh, Pa.

SINKS, FRANK FORREST. Engr. and Sales Mgr., Pacific Coast Steel Co., Stuart Bldg., Seattle, Wash.

SLOAN, DAVID. 1892 Continental and Commercial Bank Bldg., Chicago, Ill.

SOUTHWORTH, EDWARD AUGUSTUS. Box 94, Mill Valley, Cal.

STANTON, ROBERT BREWSTER. Civ. and Min. Engr., 700 West End Ave., New York City.

STEECE, EMMET ABNER. Supt. of Constr., Federal Bldgs., Amarillo, Tex.

TERRY, JOHN HERMON. Secy. and Treas., Latta & Terry, 363 Drexel Bldg., Philadelphia, Pa.

TROUT, HARRY EDGAR. Box 669, Buffalo, N. Y.

VAN ALSTYNE, HENRY ARTHUR. Pres., The Sterling Iron & Ry. Co., 475 Fifth Ave., New York City.

VOSE, RICHARD HAMPTON. 1756 West 51st Pl., Los Angeles, Cal.

WEGMANN, EDWARD. Cons. Engr., 2522 Park Row Bldg., New York City.

WOLFE, FRANK CHARLES. Chf. Engr., McLean Const. Co., 130 West Lanvale St., Baltimore, Md.

YATES, WILLIAM HENRY. 420 West 130th St., New York City.

ASSOCIATE MEMBERS

ALDERSON, WILLIAM HOWARD. Care, St. Paul Union Depot Co., St. Paul, Minn.

ALEXANDER, ROBERT LEE. Care, U. S. Reclamation Service, Payson, Utah.

AVAKIAN, JOHN CASPAR. 916 West Ninth St., Los Angeles, Cal.

AYRES, JOHN HENRY. Acting Superv. Engr., Bureau of Public Works, Vigan, Ilocos Sur, Philippine Islands.

BEAN, ERNEST DANIEL. The Bartlett, 59 Main St., Haverhill, Mass.

BEAN, PAUL LEONARD. Chf. Engr., Public Utilities Comm., State of Maine (Res., 19 Pleasant St.), Augusta, Me.

BELLAMY, HERBERT ERNEST. Naval Civ. Engr. (Bases), Care, Director of Naval Works, Commonwealth Govt., Melbourne, Australia.

BESWICK, JAMES EVERETT. Care, New York State Highway Comm., Realty Bldg., White Plains, N. Y.

BLAAUW, GEERT. 3732 Dawson St., Pittsburgh, Pa.

BORCHERS, PERRY ELMER. 1112 Seventh Ave., Seattle, Wash.

BRADBURY, ROYALL DOUGLAS. Cons. Engr., 68 Devonshire St., Boston, Mass.

BRANCH, LESTER VAN NOY. Res. Engr., Sherburne Lakes Dam, Care, U. S. Reclamation Service, Sherburne, Mont.

BROWN, GROVER CHARLES. 674 Knott St., Portland, Ore.

BROWNE, JAMES GIBBONS. 708 Stewart Bldg., Houston, Tex.

BURNS, LEWIS ANDREW. Civ. and Hydr. Engr. (Burns Eng. Co.), 46 Jefferson County Savings Bank Bldg., Watertown, N. Y.

ASSOCIATE MEMBERS (*Continued*)

BUZZELL, JOSIAH WILLIAM. New York Representative, Stone & Webster Eng. Corporation, 5 Nassau St., New York City (Res., 644 Park Ave., East Orange, N. J.).

CANAGA, GORDON BYRON. Designing Engr., Bureau of Public Works, Govt. of the Philippine Islands, Manila, Philippine Islands.

CAREW, FRANK JEROME. 1808 Marmion Ave., New York City.

CLAWITER, EDWARD IVAN. Engr., Trussed Concrete Steel Co., 2037 Central Ave., Alameda, Cal.

COLE, ERNEST DELEVAN. Contr. Engr., Allinson-Cole Constr. Co., 1404 Hobart Bldg., San Francisco, Cal.

COLLAR, WILLIAM FRANKLIN. Gen. Supt., Municipal Bridge, East St. Louis, Ill.

COLLINS, ARTHUR LEE. Cons. Engr., 421 Leavenworth St., San Francisco, Cal.

COLTMAN, ROBERT, JR. Asst. Engr., Public Service Comm., First Dist., 767 Lexington Ave., New York City.

CONNER, CARLTON NUDD. Junior Engr., U. S. A., General Delivery, Cincinnati, Ohio.

COOPER, SIDNEY WOODDELL. 1106 Myrtle Ave., Baltimore, Md.

CRAWFORD, CHARLES JOHN. Care, Anglo-American Petroleum Products Co., 32 Broadway, New York City.

CULVER, ARTHUR. Thirsk Lodge, Hornsey Lane, Highgate, N., London, England.

DIETRICH, WILLIAM HENRY. Res. Engr., U. S. Steel Products Co., 10 Strand Rd., Calcutta, India.

DIGNUM, HARRY JOCELYN. Care, A. E. Williams, United Fruit Co., Tela, Honduras.

ELDRIDGE, MAURICE OWEN. Asst. in Road Economics, Office of Public Roads, U. S. Dept. of Agriculture, Washington, D. C.

ELLIS, HERBERT CRAM. Junior Engr., Public Service Comm., First Dist., 5 West 125th St., New York City.

FREEMAN, WILLIAM BRADLY. Superintending Engr., Royal Irrig. Dist., Bangkok, Siam.

FREW, ARCHIBALD JOHN RUSSELL. Municipal Engr., Town Hall, Canterbury, New South Wales, Australia.

GANDOLFO, JOSEPH HARRINGTON. Res. Engr., The Moody Eng. Co., P. O. Box 156, San Juan, Porto Rico.

GEORGE, WALTER WHITFIELD. New Philadelphia, Ohio.

GIESTING, FRANK ALEXANDER. Cons. Engr., 423 West 120th St., New York City.

GILLESPIE, CHESTER GORDON. City Hall, Sacramento, Cal.

GORTON, WILLARD LIVERMORE. Care, W. E. Gorton, Lindsay, Cal.

GRAY, HARRY MATT. Designing Engr., Dept. of Streets and Eng., Municipal Bldg., Springfield, Mass.

CUSTAFSON, GUSTAF EDWARD. With E. C. & R. M. Shankland, 1106 The Rookery (Res., 1213 Eddy St.), Chicago, Ill.

ASSOCIATE MEMBERS (*Continued*)

HANDEYSIDE, CHARLES AUGUSTUS. Asst. Engr., U. P. R. R., Omaha, Nebr.
HARROD, TOM HIND HUDSON. Ithaca, Mich.
HAYES, FERDINAND EUGENE, JR. 326 Wyandotte St., South Bethlehem, Pa.
HIGGINSON, JONATHAN YATES. Buffalo Creek, Colo.
HOCKLEY, CLAUDE CLEMENT. Chf. Engr., Union Bag & Paper Co., Hudson Falls, N. Y.
HOUSTON, ROBERT HUGH. Supt. of Constr., U. S. A., Care, Headquarters, U. S. Troops, Ancon, Canal Zone, Panama.
HUBBARD, DANIEL. 1700 Madison Ave., Baltimore, Md.
IMMEDIATO, GERARDO. 69 West 83d St., New York City.
JONES, SIDNEY GARDNER. Reserve, Wis.
KIMBLE, HOWARD. R. 3, No. 13, Clear Lake, Iowa.
LETTON, HARRY PIKE. San. Engr., U. S. Public Health Service, U. S. Marine Hospital, 4133 Clarendon St., Chicago, Ill.
LONG, EUGENE MCLEAN. Cons. Engr. (Long & Miller), 13 Park Row, New York City.
LYON, WALLACE CHITTENDON. Hyattsville, Md.
MACKLEM, NORRIS RAYMOND. With U. S. Bridge & Pipe Co., Bay City, Mich.
MACOMBER, STANLEY. 801 Lewis Bldg., Portland, Ore.
MCCLAIN, JAMES BROWNSON. Res. Engr., Bridge Dept., Seaboard A. L. Ry., 325 Newnan St., Jacksonville, Fla.
MCDONOUGH, MICHAEL JOSEPH. Maj., Corps of Engrs., U. S. A., 25 North Pearl St., Albany, N. Y.
MADISON, JAMES TALBOTT. Box 872, Modesto, Cal.
MARCH, GEORGE MILES. Fulford, Fla.
MELICK, NEAL ALBERT. Supt. of Constr., U. S. Public Bldgs., Cadillac, Mich.
MILLER, HIRAM. Junior Engr., Office of Dept. Engr., Southern Dept., U. S. A., Fort Sam Houston, Tex.
MONSARRAT, NICHOLAS DAUBENEY. Mgr. of Mines, Sunday Creek Co., 211 Hartman Bldg., Columbus, Ohio.
NOBLE, GUY LYNN. Archt. and Engr. (Taber, Baxter & Noble), 405 Gurney Bldg., Syracuse, N. Y.
O'HEARN, JOHN LYNCH. Cons. Engr., 811 North Bishop, Dallas, Tex.
OSBOURN, HARRY VAN BUREN. 1433 Euclid Ave., Philadelphia, Pa.
PALMER, GEORGE BUSHNELL. Engr. and Supt. for Arthur McMullen Co., Foot of South Broad St., Philadelphia, Pa.
PETERSON, OTTO WALLACE. Engr., U. S. Reclamation Service, La Grange, Cal.
PITKETHLY, DAVID THOMAS. 215 Montague St. (Res., 172 Elton St.), Brooklyn, N. Y.
REICHARDT, WALTER FREDERICK. Cons. Engr., Box 115, Watertown, Wis.
RENNELL, HENRY HURD. Secy. and Treas., Rennell Constr. Co., Inc., Produce Exchange Bldg., New York City.

ASSOCIATE MEMBERS (*Continued*)

SAWHNEY, ASA NAND. Engr., Kashmere State, Bhimbar, *via* Gujrat, Punjab, India.

SCHENCK, ERNEST EUGENE. Dist. Engr., Sulu Province, Jolo, Philippine Islands.

SEIBERT, PERCY ALLEN. Civ. and Min. Engr., Clearspring, Md.

SMITH, HARRISON. Engr., T. A. Gillespie, 363 Dorchester Ave., Boston, Mass.

SMITH, TRAVIS LOGAN, JR. Machinery Salesman, 15 Main St., Houston, Tex.

STAFFORD, EDWARD SATTLEY. County Engr., Pinal County, Florence, Ariz.

STEEVES, CLARENCE MCNAUGHTON. Civ. Engr. with The Maritime Dredging & Constr. Co., Ltd., P. O. Box 336, Saint John, N. B., Canada.

STEPATH, CHARLES UNDERHILL. 7 Banta St., Elmhurst, N. Y.

STEPHENS, ALLEN WHITMORE. Engr., Turner Constr. Co., 11 Broadway (Res., 120 West 57th St.), New York City.

STEVENS, LEIGH E. Sioux Falls, S. Dak.

STODDARD, RAYMOND FRENCH. Cons. Engr., The Gulf, Milford, Conn.

SWATY, DAVID YOUNGS. Engr. with Great Lakes Dredge & Dock Co., 1630 Williamson Bldg., Cleveland, Ohio.

TALLMAN, LEROY. Supt., Flinn-O'Rourke Co., Inc., East River Tunnels, Clark and Furman Sts., Brooklyn, N. Y.

THANHEISER, CHARLES AUGUST. Supt., M., K. & T. Ry., Smithville, Tex.

TINKHAM, RALPH RUSSELL. Supt., 16th Dist., U. S. Lighthouse Service, Ketchikan, Alaska.

TROTT, DAVID CROOKER. Supt. of Constr., U. S. Public Bldgs., Bozeman, Mont.

TUDBURY, WARREN CHAMBERLAIN. Civ. and Landscape Engr., 913 South Figueroa St., Los Angeles, Cal.

TURNER, AUGUSTUS MIESSE. Engr., M. of W., Peoria and East. Div., C., C., C. & St. L. Ry., Indianapolis, Ind.

TURNEY, OMAR ASA. 357 North Fourth Ave., Phœnix, Ariz.

TYLER, ROY DEXTER. Cons. Engr., 3039 Wilson Ave., Chicago, Ill.

VANDERVOORT, BENJAMIN FRANKLIN. 587 West 178th St., New York City.

VAN RENSSELAER, ALLEN. 1200 Pine St., San Francisco, Cal.

WALTER, THOMAS ROBERT. Civ. and Architectural Engr., 915 South Park St., Kalamazoo, Mich.

WIGTON, CHARLES BENSON. Contr. Engr., Levering & Garrigues Co., 552 West 23d St., New York City.

WILSON, WILLIAM RENFREW. Care, Hongkong Shanghai Bank, London, England.

WORLEY, ALBERT HARRISON. With The Interstate Commerce Comm., 3622 Garfield Ave., Kansas City, Mo.

ASSOCIATES

BELZNER, THEODORE. Insp. in Chg., 155th Street and Riverside Drive Viaducts, Dept. of Bridges (Res., 606 West 135th St.), New York City.

ASSOCIATES (*Continued*)

BYERS, BENJAMIN BUTLER FRANKLIN. 1214 Murdock Ave., Parkersburg, W. Va.

FOSTER, CLARENCE MARVIN. Care, F. A. Coffin, R. F. D. 1, Dover, N. J.

PINCHOT, GIFFORD. 1214 Real Estate Trust Bldg., Philadelphia, Pa.

PULLAR, HAROLD BEGGS. Gen. Mgr., The Pioneer Asphalt Co., Lawrenceville, Ill.

SOMMER, ALBERT. Mgr., Deutsche Trinidad Asphalt Gesellschaft, Münchnerplatz 14, Dresden, Germany.

JUNIORS

ACKHART, ANDREW LEWIS. Highland, N. Y.

ANDERSON, JOHN HENNING. Asst. Engr., Universal Portland Cement Co., 532 Frick Bldg., Pittsburgh, Pa.

BAKER, HAROLD WALLACE. 208 Main St., Oneida, N. Y.

BENDEL, JACOB. Junior Engr., Public Service Comm., First Dist. (Res., 943 Whitlock Ave.), New York City.

BITHER, TOM ALLEN. 1630 Josephine St., Berkeley, Cal.

BOVYER, WILLIAM BLAIR. Asst. City Engr., 760 Eighth Ave., San Francisco, Cal.

BRADSTREET, HERBERT NEAL. Care, Surveyor-General of Arizona, Phœnix, Ariz.

BRINKERHOFF, GEORGE LOCKWOOD. 1279 Cole St., Columbus, Ohio.

CASPARI, FREDERICK WILLIAM. Res. Engr., State Dept. of Health, 16 West Saratoga St., Baltimore, Md.

DIMMLER, CHARLES LOUIS. Asst. Engr., Div. of Works, Panama-Pacific International Exposition, 1511 Masonic Ave., San Francisco, Cal.

EBERLY, VIRGIL ALLEN. Care, Interstate Commerce Comm., 9th Floor, Karpen Bldg., Chicago, Ill.

GILKISON, GORDON MERCER. 34 Arkledun Ave., Hamilton, Ont., Canada.

KELLY, JOHN ARTHUR. 900 South 10th St., Philadelphia, Pa.

KING, TAO. Asst. Engr., Nanking-Hunan Ry., Care, Post-Office, Nanchang, Kiangsi, China.

KOCH, OTTO HERMAN SIEGFRIED. 1134 Simpson St., New York City.

LUCCHETTI-OTERO, ANTONIO SEBASTIAN. Care, Bureau of Public Works, San Juan, Porto Rico.

MAYO, GEORGE. 1921 Nineteenth St., N. W., Washington, D. C.

MORGAN, JOSEPH HOLLOWAY. Junior Engr., U. S. Geological Survey, Water Resources Branch, 328 Custom House, San Francisco, Cal.

MURPHY, ALVIN RUSH. Fountain City, Tenn.

PICKFORD, EDMUND JOHN. Care, Edmund D. Pickford, P. O. Box 4242, Johannesburg, Transvaal, South Africa.

PIPER, HARRY PAUL, JR. Mgr., Cost Dept., S. S. Sanford & Sons, Inc., 5½ Grant Ave., Amsterdam, N. Y.

RICE, ROGER CUSHING. Care, U. S. Geological Survey, Kapiolani Bldg., Honolulu, Hawaii.

JUNIORS (*Continued*)

ROSSI, IRVING. Structural Draftsman, Milliken Bros., Inc., 215 Fairview Ave., Jersey City, N. J.

SCHROEDER, SEATON, JR. Engr., M. of W., Charleston Interurban R. R., Charleston, W. Va.

SCHUYLER, WALTER WESLEY. Care, United Fruit Co., Bocas del Toro, Panama.

SHAPLEIGH, CHARLES HENRY. Asst. Engr. to the Asst. to the Pres., N. O. & N. E. R. R., Q. & C. Bldg., New Orleans, La.

SHAW, GUY RAY. Victoria Hotel, Des Moines, Iowa.

SMITH, WILLIAM DURKEE. Structural Draftsman, Port of Seattle Comm., 112 North 51st St., Seattle, Wash.

WARING, FREDERICK HOLMAN. Filtration Chemist, Miraflores Filtration Plant, Corozal, Canal Zone, Panama.

RESIGNATIONS

MEMBERS	Date of Resignation.
COMPTON, CHARLES SUMNER	Dec. 31, 1914
IVES, ARTHUR STANLEY	Dec. 31, 1914
ASSOCIATE MEMBERS	
BABÉ, JOSEPH MANUEL	Dec. 31, 1914
DUFFEE, LOUIS WARREN	Dec. 31, 1914
KORSMO, AMUND MARIUS	Dec. 31, 1914
SESSER, JOHN CORNELIOUS	Dec. 31, 1914
JUNIORS	
EDMUNDSON, HAROLD BOWEN	Dec. 31, 1914
MALMROS, NILS LORENTZ ALFRED	Dec. 31, 1914
OTTOSEN, PETER HILL	Dec. 31, 1914

DEATHS

COOKE, SAINT GEORGE HENRY. Elected Associate Member, January 5th, 1909; died January 12th, 1915.

CROWELL, FOSTER. Elected Member, December 1st, 1880; died March 29th, 1915.

HAMBLETON, FRANCIS HENRY. Elected Member, March 5th, 1873; died March 19th, 1915.

HUNTER, WILLIAM. Elected Member, June 5th, 1895; died April 2d, 1915.

JOHNSON, CHAPMAN LOVE. Elected Member, October 7th, 1903; died March 11th, 1915.

MCFARLAND, WALTER ASHFIELD. Elected Member, May 3d, 1910; died March 17th, 1915.

MOORE, WILLIAM EDWIN. Elected Member, February 7th, 1906; died January 24th, 1915.

DEATHS (*Continued*)

MORRIS, HENRY GURNEY. Elected Member, December 4th, 1867; date of death unknown.

RICH, ISAAC. Elected Member, May 6th, 1903; died March 11th, 1915.

RUSSELL, WILLIAM GARDNER. Elected Member, October 4th, 1905; died March 5th, 1915.

Total Membership of the Society, April 8th, 1915, 7 737.

MONTHLY LIST OF RECENT ENGINEERING ARTICLES OF INTEREST

(March 2d to April 3d, 1915)

NOTE.—*This list is published for the purpose of placing before the members of this Society, the titles of current engineering articles, which can be referred to in any available engineering library, or can be procured by addressing the publication directly, the address and price being given wherever possible.*

LIST OF PUBLICATIONS

In the subjoined list of articles, references are given by the number prefixed to each journal in this list:

(1) *Journal*, Assoc. Eng. Soc., St. Louis, Mo., 30c.
(2) *Proceedings*, Engrs. Club of Phila., Philadelphia, Pa.
(3) *Journal*, Franklin Inst., Philadelphia, Pa., 50c.
(4) *Journal*, Western Soc. of Engrs., Chicago, Ill., 50c.
(5) *Transactions*, Can. Soc. C. E., Montreal, Que., Canada.
(6) *School of Mines Quarterly*, Columbia Univ., New York City, 50c.
(7) *Gesundheits Ingenieur*, München, Germany.
(8) *Stevens Institute Indicator*, Hoboken, N. J., 50c.
(9) *Engineering Magazine*, New York City, 25c.
(11) *Engineering* (London), W. H. Wiley, 432 Fourth Ave., New York City, 25c.
(12) *The Engineer* (London), International News Co., New York City, 35c.
(13) *Engineering News*, New York City, 15c.
(14) *Engineering Record*, New York City, 10c.
(15) *Railway Age Gazette*, New York City, 15c.
(16) *Engineering and Mining Journal*, New York City, 15c.
(17) *Electric Railway Journal*, New York City, 10c.
(18) *Railway Review*, Chicago, Ill., 15c.
(19) *Scientific American Supplement*, New York City, 10c.
(20) *Iron Age*, New York City, 20c.
(21) *Railway Engineer*, London, England, 1s. 2d.
(22) *Iron and Coal Trades Review*, London, England, 6d.
(23) *Railway Gazette*, London, England, 6d.
(24) *American Gas Light Journal*, New York City, 10c.
(25) *Railway Age Gazette*, Mechanical Edition, New York City, 20c.
(26) *Electrical Review*, London, England, 4d.
(27) *Electrical World*, New York City, 10c.
(28) *Journal*, New England Water-Works Assoc., Boston, Mass., $1.
(29) *Journal*, Royal Society of Arts, London, England, 6d.
(30) *Annales des Travaux Publics de Belgique*, Brussels, Belgium, 4 fr.
(31) *Annales* de l'Assoc. des Ing. Sortis des Ecoles Spéciales de Gand, Brussels, Belgium, 4 fr.
(32) *Mémoires et Compte Rendu des Travaux*, Soc. Ing. Civ. de France, Paris, France.
(33) *Le Génie Civil*, Paris France, 1 fr.
(34) *Portefeuille Economiques des Machines*, Paris, France.
(35) *Nouvelles Annales de la Construction*, Paris, France.
(36) *Cornell Civil Engineer*, Ithaca, N. Y.
(37) *Revue de Mécanique*, Paris, France.
(38) *Revue Générale des Chemins de Fer et des Tramways*, Paris, France.
(39) *Technisches Gemeindeblatt*, Berlin, Germany, 0, 70m.
(40) *Zentralblatt der Bauverwaltung*, Berlin, Germany, 60 pfg.
(41) *Electrotechnische Zeitschrift*, Berlin, Germany.
(42) *Proceedings*, Am. Inst. Elec. Engrs., New York City, $1.
(43) *Annales des Ponts et Chaussées*, Paris, France.
(44) *Journal*, Military Service Institution, Governors Island, New York Harbor, 50c.
(45) *Colliery Engineer*, Scranton, Pa., 25c.
(46) *Scientific American*, New York City, 15c.
(47) *Mechanical Engineer*, Manchester, England, 3d.
(48) *Zeitschrift*, Verein Deutscher Ingenieure, Berlin, Germany, 1, 60m.
(49) *Zeitschrift für Bauwesen*, Berlin, Germany.
(50) *Stahl und Eisen*, Düsseldorf, Germany.
(51) *Deutsche Bauzeitung*, Berlin, Germany.
(52) *Rigasche Industrie-Zeitung*, Riga, Russia, 25 kop.
(53) *Zeitschrift*, Oesterreichischer Ingenieur und Architekten Verein, Vienna, Austria, 70h.
(54) *Transactions*, Am. Soc. C. E., New York City, $12.
(55) *Transactions*, Am. Soc. M. E., New York City, $10.
(56) *Transactions*, Am. Inst. Min. Engrs., New York City, $6.

(57) *Colliery Guardian*, London, England, 5d.
(58) *Proceedings*, Engrs.' Soc. W. Pa., 2511 Oliver Bldg., Pittsburgh, Pa., 50c.
(59) *Proceedings*, American Water-Works Assoc., Troy, N. Y.
(60) *Municipal Engineering*, Indianapolis, Ind., 25c.
(61) *Proceedings*, Western Railway Club, 225 Dearborn St., Chicago, Ill., 25c.
(62) *Steel and Iron*, Thaw Bldg., Pittsburgh, Pa., 10c.
(63) *Minutes of Proceedings*, Inst. C. E., London, England.
(64) *Power*, New York City, 5c.
(65) *Official Proceedings*, New York Railroad Club, Brooklyn, N. Y., 15c.
(66) *Journal of Gas Lighting*, London, England, 6d.
(67) *Cement and Engineering News*, Chicago, Ill., 25c.
(68) *Mining Journal*, London, England, 6d.
(69) *Der Eisenbau*, Leipzig, Germany.
(71) *Journal*, Iron and Steel Inst., London, England.
(71a) *Carnegie Scholarship Memoirs*, Iron and Steel Inst., London, England.
(72) *American Machinist*, New York City, 15c.
(73) *Electrician*, London, England, 18c.
(74) *Transactions*, Inst. of Min. and Metal., London, England.
(75) *Proceedings*, Inst. of Mech. Engrs., London, England.
(76) *Brick*, Chicago, Ill., 20c.
(77) *Journal*, Inst. Elec. Engrs., London, England, 5s.
(78) *Beton und Eisen*, Vienna, Austria, 1, 50m.
(79) *Forscherarbeiten*, Vienna, Austria.
(80) *Tonindustrie Zeitung*, Berlin, Germany.
(81) *Zeitschrift für Architektur und Ingenieurwesen*, Wiesbaden, Germany.
(82) *Mining and Engineering World*, Chicago, Ill., 10c.
(83) *Gas Age*, New York City, 15c.
(84) *Le Ciment*, Paris, France.
(85) *Proceedings*, Am. Ry. Eng. Assoc., Chicago, Ill.
(86) *Engineering-Contracting*, Chicago, Ill., 10c.
(87) *Railway Engineering and Maintenance of Way*, Chicago, Ill., 10c.
(88) *Bulletin* of the International Ry. Congress Assoc., Brussels, Belgium.
(89) *Proceedings*, Am. Soc. for Testing Materials, Philadelphia, Pa., $5.
(90) *Transactions*, Inst. of Naval Archts., London, England.
(91) *Transactions*, Soc. Naval Archts. and Marine Engrs., New York City.
(92) *Bulletin*, Soc. d'Encouragement pour l'Industrie Nationale, Paris, France.
(93) *Revue de Métallurgie*, Paris, France, 4 fr. 50.
(95) *International Marine Engineering*, New York City, 20c.
(96) *Canadian Engineer*, Toronto, Ont., Canada, 10c.
(98) *Journal*, Engrs. Soc. Pa., Harrisburg, Pa., 30c.
(99) *Proceedings*, Am. Soc. of Municipal Improvements, New York City, $2.
(100) *Professional Memoirs*, Corps of Engrs., U. S. A., Washington, D. C., 50c.
(101) *Metal Worker*, New York City, 10c.
(102) *Organ für die Fortschritte des Eisenbahnwesens*, Wiesbaden, Germany.
(103) *Mining Press*, San Francisco, Cal., 10c.
(104) *The Surveyor and Municipal and County Engineer*, London, England, 6d.
(105) *Metallurgical and Chemical Engineering*, New York City, 25c.
(106) *Transactions*, Inst. of Min. Engrs., London, England, 6s.
(107) *Schweizerische Bauzeitung*, Zürich, Switzerland.
(108) *Iron Tradesman*, Atlanta, Ga., 10c.
(109) *Journal*, Boston Soc. C. E., Boston, Mass., 50c.
(110) *Journal*, Am. Concrete Inst., Philadelphia, Pa., 50c.
(111) *Journal of Electricity, Power and Gas*, San Francisco, Cal., 25c.
(112) *Internationale Zeitschrift für Wasser-Versorgung*, Leipzig, Germany.

LIST OF ARTICLES

Bridges.

Construction of the Fallsway Viaduct, Baltimore, Md.* Louis R. Gons. (67) Mar.
Renewal of Maribyrnong (Saltwater River Bridge), Victorian State Railways.* F. K. Esling. (From the *Commonwealth Engineer.*) (21) Mar.
Billings Bridge over Rideau River, Ottawa.* (96) Mar. 4.
Concrete Arch Bridge at Saskatoon.* (13) Mar. 4; (96) Mar. 18.
The Erection Traveler, New Quebec Bridge.* (13) Mar. 4.
New Swing-Bridge, Whitby.* W. Noble Twelvetrees. (11) Serial beginning Mar. 5.
Viaduct Construction on the Kansas City Terminal.* A. R. Eitzen. (15) Mar. 5.
Wood Block Replaces Plank as Steel Bridge Flooring. Edward Stingel. (14) Mar. 6.
Replacing a Large Truss Bridge by Lateral Movement. J. C. Bland and John Miller. (Paper read before the Am. Assoc. for the Advancement of Science.) (15) Mar. 12.

* Illustrated.

Bridges—(Continued).

Coating Disintegrated Stone Abutments with Concrete; Repair Work under Traffic of Bridge of Chicago & Western Indiana Railroad over Chicago Drainage Canal.* (14) Mar. 13.
Dismantling Truss Spans and Erecting Plate Girders Without False Work, W. & L. E. R. R.* E. V. Smith. (18) Mar. 13.
New Concrete Arch Viaduct of the Philadelphia, Baltimore & Washington R. R. over Gwynns Falls, Baltimore, Md.* (18) Mar. 13.
Pennsylvania's Concrete Bridge over the Susquehanna.* (14) Mar. 13.
Rolling Lift Bridges for the Delray Connecting R. R.* (18) Mar. 13.
Some Bridge Work of the C. M. & St. P. Ry.* (18) Mar. 13.
Substructure for the Jackson St. Bridge over the Chicago River.* (13) Mar. 18.
The Development of the Sudan.* (12) Mar. 19.
Notable Structures on the Spokane-Ayer Cut-off.* (15) Mar. 19.
Design of the Reinforced Concrete Cantilever Bridge on Runnymede Ave., Cleveland, Ohio.* (86) Serial beginning Mar. 24.
A Balanced Cantilever Reinforced-Concrete Bridge.* Henry H. Quimby. (13) Mar. 25.
Congress St. Bridge across the Hudson River at Troy, N. Y.; Structural Features.* Henry W. Hodge. (13) Mar. 25.
Jacking up a Concrete Arch over a Settling Pier.* W. P. Darwin. (13) Mar. 25.
Record Set for Weight of Steel Erected in One Day.* (14) Mar. 27.
The Economic Design of Culverts for Various Depths of Fills.* P. K. Sheidler. (Paper read before the Ohio Eng. Soc.) (86) Mar. 31.
An Economical Bridge-Pier Foundation.* Milo K. Temple. (13) Apr. 1.
Low Water Bridges over Torrential Streams, Bexar Co., Texas.* Terrell Bartlett. (13) Apr. 1.
Wind Stresses in Skew Bridges.* J. P. J. Williams. (13) Apr. 1.
Substructure Conditions Fix Design of Chicago & North Western Bridge at Pekin.* C. F. Dalston. (14) Apr. 3.
Le Pont de Sara, sur le Gange.* (33) Mar. 6.
Pont en Béton Armé, sur l'Aar, à Olten (Suisse).* (33) Mar. 20.
Neues Verfahren zur raschen Ermittelung der Biegungsmomente in eingespannten Gewölben nebst Pfeilern und Widerlagern. R. Färber. (51) Serial beginning Sup. No. 5.
Winddruck bei Brücken. Heinrich Saller. (40) Jan. 2.

Electrical.

Induction Regulators.* G. H. Eardley-Wilmot. (73) Feb. 19.
Alternating Current Reverse Relays.* C. C. Garrard. (73) Serial beginning Feb. 26.
The Electricity Supply to Port Glasgow from Greenock.* (26) Feb. 26.
Fractional Horse-Power Motor Load.* Bernard Lester. (42) Mar.
Methods, Data, and New Apparatus for Measuring Electrical Conductivity Above 1500° C. of Vapors at Normal Pressure.* Edwin F. Northrup. (3) Mar.
Paints to Prevent Electrolysis in Concrete Structures.* Henry A. Gardner. (3) Mar.
Some Troubles Encountered in the Operation of Carbon Brushes in Direct-Current Generators and Motors.* E. H. Martindale. (42) Mar.
Train Dispatching by Wireless. L. B. Foley. (65) Mar.
Transcontinental Telephone Service.* P. C. Staples. (98) Mar.
Future Operation of Long Electric Transmission Lines.* R. A. Philip. (13) Mar. 4.
The Kolster Decremeter.* (73) Mar. 5.
Projected New Power Station for Manchester. (12) Mar. 5.
The Ultraudion Detector for Undamped Waves.* Lee De Forest. (73) Mar. 5.
Records of Radio Time Signals.* C. W. Waggoner. (Paper read before the Am. Physical Soc.) (19) Mar. 6.
The Selective Time Element of Relays.* Paul MacGahan. (27) Mar. 6.
The Beck Searchlight.* (11) Mar. 12.
Underground Wires on the Panama Railroad.* (15) Mar. 12.
Searchlight Projectors.* C. W. Denny. (26) Serial beginning Mar. 12.
Central Generating System for University of Michigan.* (27) Mar. 13.
The Double-Audion Type of Receiver.* A. H. Taylor. (27) Mar. 13.
Factors in Rate-Making. Arthur S. Ives. (27) Serial beginning Mar. 13.
The Relation of the Horse-Power to the Kilowatt. (From *Circular 34*, U. S. Bureau of Standards.) (19) Mar. 13.
Polyphase Commutator Machines and Their Application. N. Shuttleworth. (77) Mar. 15.
Conditions Affecting the Variations in Strength of Wireless Signals.* E. W. Marchant. (77) Mar. 15.
Laying a 6-Ft. Pipe Tunnel Across the Milwaukee River.* (13) Mar. 18.
On the Measurement of Alternating Electric Currents of High Frequency. Albert Campbell and D. W. Dye. (Abstract of paper read before the Royal Soc.) (73) Mar. 19.

* Illustrated.

Electrical—(Continued).

Hydroelectric Development at Cohoes, N. Y.* **(27)** Mar. 20.
Radiotelegraphy Without Elevated Antennas.* Charles A. Culver and John A. Riner. **(27)** Mar. 20.
Photometry of Incandescent Lamps.* J. W. Roper. (Paper read before the Yorkshire, England, Junior Gas Assoc.) **(24)** Mar. 22.
Auxiliary Station for Transmission System.* Curtis A. Mees. **(27)** Mar. 27.
The Principles of Radio-Telephony.* John L. Hogan, Jr. **(46)** Mar. 27.
Class Rates for Light and Power Systems or Territories.* Frank G. Baum. **(42)** Apr.
Continuous Waves in Long Distance Radio Telegraphy.* L. F. Fuller. **(42)** Apr.
Electrical Precipitation. F. G. Cottrell. **(42)** Apr.
The Flow of Energy.* Robert A. Philip. **(42)** Apr.
Mill Controllers.* H. F. Stratton. **(42)** Apr.
Practical Applications of Electrical Precipitation and Progress of the Research Corporation. Linn Bradley. **(42)** Apr.
Regulation of Electrotyping Solutions. (From *Circular No. 52*, U. S. Bureau of Standards.) **(105)** Apr.
The Theoretical and Experimental Consideration of Electrical Precipitation. A. F. Nesbit. **(42)** Apr.
A New Printing Telegraph System.* Paul M. Rainey. **(27)** Apr. 3.
Der Schnellregler und der Eilregler der Siemens-Schuckertwerke.* G. Ernst Grau. **(41)** Feb. 11.
Wechselstrompufferung.* L. Schröder. **(41)** Serial beginning Feb. 11.
Die Starkstrom-Elektrotechnik in Gruppe 33B an der Schweiz. Landesausstellung. Bern, 1914.* W. Kummer. **(107)** Feb. 13.
Schutz von Schwachstromleitungen gegen Starkstrom.* Fritz Schröter. **(41)** Feb. 18.
Eine gefahrlose metallische Röntgenröhre.* L. Zehnder. **(107)** Feb. 20.
Die elektrische Durchschlagsfestigkeit von flüssigen, halbfesten und festen Isolierstoffen in Abhängigkeit vom Druck.* F. Kock. **(41)** Serial beginning Feb. 25.
Verfahren zur Erlangung sinusförmiger Spannungskurven bei ein- und mehrphasigen Wechselstromdynamos.* W. Seeman. **(41)** Mar. 4.
Dielektrische Eigenschaften von verschiedenen Isolierstoffen.* Karl Willy Wagner. **(41)** Serial beginning Mar. 11.

Marine.

Small Screw Propellers.* D. H. Jackson. (Paper read before the Inst. of Marine Engrs.) **(47)** Feb. 26.
The Modern Submarine in Naval Warfare.* R. H. M. Robinson. **(3)** Mar.
The Governing of Marine Steam Turbines.* **(12)** Mar. 5.
Failure of British Steel Ship Plates.* W. J. B. Wilson. (Paper read before the Northeast Coast Institution of Engrs. and Shipbuilders.) **(20)** Mar. 18.
Robinson Marine Superheater.* **(12)** Mar. 19.
The Modern Submarine.* C. A. Ward. (From *Journal* of the Am. Soc. of Marine Draftsmen.) **(9)** Apr.
The Submarine at Sea.* **(46)** Apr. 3.
Le Transport des Mines Marines par les Courants sous l'Action de la Houle. E. Bertin. **(33)** Feb. 27.
Spannungsmessungen an Bord von Schiffen.* Siemann. **(48)** July 18.

Mechanical.

The Metaline Plant of the Inland Portland Cement Co., Metaline Falls, Wash.* Milo W. Krejci. **(56)** Vol. 46.
The Great Falls Flue System and Chimney.* C. W. Goodale and J. H. Klepinger. **(56)** Vol. 46.
Cement Materials and the Manufacture of Portland Cement in Montana. W. H. Andrews. **(56)** Vol. 46.
The Use of Pulverized Coal as a Fuel for Metallurgical Furnaces. H. R. Barnhurst. **(56)** Vol. 47.
The Cleaning of Blast-Furnace Gas.* W. A. Forbes. **(56)** Vol. 47.
The Scoria Process for the Manufacture of Fine-Ore Briquettes, Flue-Dust Briquettes, and Slag Brick for Building Purposes. Ernest Stütz. **(56)** Vol. 47.
Note on the Utilization of the Waste Heat of Regenerative Furnaces. George C. Stone. **(56)** Vol. 47.
The Generation of Steam by Waste Heat from Furnaces.* F. Peter. (Translated by R. W. Raymond.) **(56)** Vol. 47.
The Slagging Gas Producer. William Hutton Blauvelt. **(56)** Vol. 47.
The Briquetting of Flue-Dust in the United States by the Schumacher Process.* Felix A. Vogel and A. M. Tweedy. **(56)** Vol. 47.
Air Conditioning.* J. Irvine Lyle. **(2)** Jan.
Bituminous Coals; Predetermination of Their Clinkering Action by Laboratory Tests.* F. C. Hubley. **(2)** Jan.

---

* Illustrated.

Mechanical—(Continued).

The Burmeister and Wain Oil Engine.* (11) Feb. 19.
The High-Speed Gas Engine.* R. Embleton. (Paper read before the Junior Institution of Engrs.) (47) Feb. 19.
Malleable Iron for Automobiles. Richard Moldenke. (Paper read before the Am. Soc. of Automobile Engrs.) (47) Feb. 19.
Swiss Turbo-Generator Sets.* (12) Feb. 19.
The Useful Recovery of Heat Losses in Internal-Combustion Engines.* J. B. Meriam. (Paper read before the Cleveland Eng. Soc.) (47) Feb. 19.
The Dumping of Refuse by Aerial Ropeway.* A. Varty. (Paper read before the North of England Branch of the National Assoc. of Colliery Mgrs.) (22) Feb. 26.
The Floating Crane Failure at the Panama Canal.* (11) Feb. 26.
Telpher Coal-Handling Plant.* (11) Serial beginning Feb. 26.
Utilisation of Blast-Furnace Slag.* (22) Feb. 26.
The Cost of Bus Operation.* (17) Feb. 27.
Industrial Uses of Fuel Oil.* F. B. Dunn. (111) Serial beginning Feb. 27.
Application of Electricity to the Ore-Handling Industry.* C. D. Gilpin. (42) Mar.
Electric Drive for Economic Operation and Development of Cement Mills.* J. Benton Porter. (55) Mar.
Factors in Hardening Tool Steel.* John A. Mathews and Howard J. Stagg, Jr. (55) Mar.
Gas Producers. R. H. Fernald. (Abstract of paper read before the Cleveland Eng. Soc.) (45) Mar.
The Jitney Bus.* Frank Reed. (60) Mar.
Line Disturbance Caused by Special Squirrel-Cage and Wound-Rotor Motors when Starting Elevators and Hoists. J. C. Lincoln. (42) Mar.
A New Building Material (for Manufacturing Brick).* (60) Mar.
A New Volume Regulator for Air Compressors.* Ragnar Wikander. (55) Mar.
Rock-Crushing Plant of the National Limestone Company.* (67) Mar.
Standardization of Chilled Iron Crane Wheels.* F. K. Vial. (55) Mar.
Physical Laws of Methane Gas.* P. F. Walker. (55) Mar.
Gas Furnaces for Industrial Purposes. (66) Mar. 2.
Maintenance of Gas Apparatus.* H. Kendrick. (Paper read before the Manchester Dist. Institution of Gas Engrs.) (66) Mar. 2.
Mechanical Transport of Coke, Comparative Efficiencies and Costs.* R. E. Gibson. (Paper read before the Manchester Dist. Institution of Gas Engrs.) (66) Mar. 2.
The Proper Construction of Hollow Ware Dies.* Ernest W. Knapp. (76) Mar. 2.
Stamping Plant for Quantity Production.* F. L. Prentiss. (20) Mar. 4.
The Electric Vehicle.* (26) Mar. 5.
Engines and Rolling Mills in an American Steel Works.* (12) Mar. 5.
Gas Piping Practice in Eastern City. H. R. Sterrett. (Paper read before the Illuminating Eng. Soc.) (101) Mar. 5.
The Processes of Manufacture of Wrought Iron and Steel Tubes.* J. G. Stewart. (Paper read before the Engrs. and Shipbuilders in Scotland.) (47) Serial beginning Mar. 5.
The Safe Running of Grinding Wheels. (47) Mar. 5.
The New Coal Gas Installation at Fall River.* C. W. Hunter. (Paper read before the New England Assoc. of Gas Engrs.) (24) Mar. 8.
Northampton, Mass., Rate Case. (24) Mar. 8.
Carbonization in Vertical Retorts.* David Fulton. (Paper read before the Scottish Junior Gas Assoc.) (66) Mar. 9.
Notes on Deposits Taken from the Manufacturing and Distribution Systems.* William Buckley. (Paper read before the Manchester Junior Gas Assoc.) (66) Mar. 9.
Coal Pier with Car-Dumping Machine at Sandusky.* (13) Mar. 11.
Measuring and Recording Temperatures in Heat Treatment.* (72) Mar. 11.
The New Knox Four-Wheel Tractor Truck.* (13) Mar. 11.
Running Costs of Motor Vehicles. Robert W. A. Brewer. (Paper read before the Soc. of Engrs.) (47) Serial beginning Mar. 12.
The Diesel Engine. Chas. H. McGwire. (Paper read before the Archts. and Engrs. Assoc. of Los Angeles.) (111) Mar. 13.
Coal Gas Candle Power Determinations. L. J. Willien. (Paper read before the New England Assoc. of Gas Engrs.) (83) Mar. 15.
Comparative Costs of Gas and Electricity for Illuminating Purposes. B. K. Cash. (Paper read before the Indiana Gas Assoc.) (24) Mar. 15.
Moving Stocks at Supply and Field Depots.* Charles C. Lynde. (62) Mar. 15.
Wisconsin Commission Methods of Rate Making. E. N. Strait. (Abstract of paper read before the Wisconsin Gas Assoc.) (83) Mar. 15.
Compressing Installations.* R. G. Marsh. (Paper read before the Midland Junior Gas Assoc.) (66) Mar. 16.
Kiln Expansion and Bracing. Carl B. Harrop. (Paper read before the National Brick Manufacturers' Convention.) (76) Serial beginning Mar. 16.

* Illustrated.

Mechanical—(Continued).

Machinery for Deep Well Pumping Plants. D. A. Graham. (Paper read before the Illinois Soc. of Engrs. and Surveyors.) (96) Mar. 18.
Gas and Steam Engines and the Turbine. J. E. Johnson, Jr. (Paper read before the Eng. Assoc. of State College, Penn.) (20) Mar. 18.
A New Revolving Steam-Shovel.* (13) Mar. 18.
A New Electric Omnibus for York.* (12) Mar. 19.
Cutting Tools.* (12) Mar. 19.
Spring Pressure on Cams.* (11) Mar. 19.
The Uses of Coal Gas for Industrial Purposes. H. M. Thornton. (29) Mar. 19.
Application of By-Product Coke Ovens to the Gas Industry. J. D. Forrest. (Paper read before the Indiana Gas Assoc.) (24) Mar. 22.
Studebaker Corporation Grey Iron Foundry. M. R. Kavanaugh. (62) Mar. 22.
A Modern Rock-Crushing Plant.* Preston K. Yates. (13) Mar. 25.
The Superheated Steam Unit.* Warren H. Miller. (46) Mar. 27.
The Diesel Engine for the Contractor, Why Not?* H. D. Hammond. (14) Mar. 27.
Industrial Gas.* J. C. Shepard. (Paper read before the Indiana Gas Assoc.) (24) Mar. 29.
Gas Rates. J. H. Maxon. (Paper read before the Indiana Gas Assoc.) (24) Mar. 29.
When Die Casting Should Prove the Economical Method.* W. H. Scherer. (From the *Electric Journal.*) (62) Mar. 29.
Economical Design of Low-Pressure Steam Mains.* A. Langstaff Johnston, Jr. (9) Apr.
The Alternating-Current Coal Hoist. Raymond E. Brown. (42) Apr.
Industrial Control in the Foundry.* R. H. McLain. (42) Apr.
Bibliography of By-Products of Gas Manufacture. (83) Serial beginning Apr. 1.
Lead Wool Joints for a 36-Inch Main.* C. E. Reinicker. (Paper read before the Illinois Gas Assoc.) (83) Apr. 1.
New Inclined Retorts at Decatur.* R. B. Richardson. (Paper read before the Illinois Gas Assoc.) (83) Apr. 1.
Sherardizing for Rust-Proofing Metals.* Chester L. Lucas. (From *Machinery.*) (19) Apr. 3.
Les Dispositifs de Fermeture des Tremies de Silos pour Matières Pondéreuses.* (33) Feb. 27.
L'Affinage du Sel Gemme par Voie Séche à l'Usine de Carrickfergus (Irlande).* (33) Mar. 13.
Rupture, Pendant les Essais, d'une Grue Flottante de 250 Tonnes, du Canal de Panama.* (33) Mar. 20.
Vergleichende Untersuchungen von Mineral-Schmierölen mit 1, 5 vH Zusatz von Oildag.* A. Saytzeff. (48) July 18.
Die Entwicklung im Bau von Gleichstrom-Dampfmaschinen.* J. Stumpf. (48) July 18.
Die Gaswirtschaft auf Eisenhüttenwerken. K. Rummel. (48) July 18.
Die Koksofenanlage Bauart Collin auf Zeche Radbod.* H. Groeck. (48) Feb. 6.
Neuere Fortschritte im Bau von Turbogebläsen und Turbokompressoren.* H. Wunderlich. (48) Serial beginning Feb. 13.
Verladebrücken neuerer Bauart.* Leopold Feigl. (48) Serial beginning Feb. 20.
Die Schleifmaschinen, ihr Bau und ihre Aufgaben in der modernen Fabrikation.* F. Schwerd. (48) Serial beginning Mar. 6.

Metallurgical.

The Tooele Plant of the International Smelting & Refining Co.* H. N. Thomson and L. T. Sicka. (56) Vol. 46.
Thermal Effect of Blast-Furnace Jackets.* Robert P. Roberts. (56) Vol. 46.
Some Recent American Progress in the Assay of Copper-Bullion.* Edward Keller. (56) Vol. 46.
Roasting and Leaching Tailings at Anaconda, Mont.* Frederick Laist. (56) Vol. 46.
The Precipitation of Copper from the Mine Waters of the Butte District. J. C. Febles. (56) Vol. 46.
Notes on the Metallography of Refined Copper.* Earl S. Bardwell. (56) Vol. 46.
Notes on the Great Falls Electrolytic Plant.* Willis T. Burns. (56) Vol. 46.
Notes on the Electrolytic Refining of Copper Precipitate Anodes. W. T. Burns. (56) Vol. 46.
Monolithic Magnetite Linings for Basic Copper Converters. Archer E. Wheeler and Milo W. Krejci. (56) Vol. 46.
Increasing the Efficiency of MacDougall Roasters at the Great Falls Smelter of the Anaconda Copper Mining Co.* Frank R. Corwin and Selden S. Rodgers. (56) Vol. 46.
The Great Falls System of Concentration.* Albert E. Wiggin. (56) Vol. 46.
Great Falls Converter Practice.* Archer E. Wheeler and Milo W. Krejci. (56) Vol. 46.

* Illustrated.

Metallurgical—(Continued).

The Evolution of the Round Table for the Treatment of Metalliferous Slimes.* Theodore Simons. (56) Vol. 46.
The Development of Blast-Furnace Construction at the Boston & Montana Smelter.* J. A. Church. (56) Vol. 46.
Development of the Basic-Lined Converter for Copper Mattes.* E. P. Mathewson. (56) Vol. 46.
Ore-Dressing Improvements. Robert H. Richards. (56) Vol. 46.
Determination of Gases in Smelter Flues, and Notes on the Determination of Dust Losses at the Washoe Reduction Works, Anaconda, Mont.* Edgar M. Dunn. (56) Vol. 46.
The Determination of Arsenic and Antimony in Converter and Electrolytic Copper. E. E. Brownson. (56) Vol. 46.
Concentration of Slimes at Anaconda, Mont.* Ralph Hayden. (56) Vol. 46.
Arsenic Trioxide from Flue Dust. James O. Elton. (56) Vol. 46.
The Anaconda Classifier.* Robert Ammon. (56) Vol. 46.
Application of Hindered Settling to Hydraulic Classifiers.* Earl S. Bardwell. (56) Vol. 46.
The Use of Nodulized Ore in the Blast Furnace. Richard Henry Lee. (56) Vol. 47.
The Smelting of Copper Ores in the Electric Furnace.* Dorsey A. Lyon and Robert M. Keeney. (56) Vol. 47.
The Reducibility of Metallic Oxides as Affected by Heat Treatment.* Woolsey McA. Johnson. (56) Vol. 47.
Over-Oxidation of Steel.* W. R. Shimer and F. O. Kichline. (56) Vol. 47.
The Life of Crucible Steel Furnaces. John Howe Hall. (56) Vol. 47.
Preparation of Ore Containing Zinc for the Recovery of Other Metals Such as Silver, Gold, Copper, and Lead by the Elimination and Subsequent Recovery of the Zinc as a Chemically Pure Zinc Product. S. E. Bretherton. (56) Vol. 47.
The Influence of Various Elements on the Absorption of Carbon by Steel.* Robert R. Abbott. (56) Vol. 47.
The Influence of Copper Upon the Physical Properties of Steel.* G. Howell Clevenger and Bhupendranath Ray. (56) Vol. 47.
Hardinge Mills *vs.* Chilean Mills.* Robert Franke. (56) Vol. 47.
Grain Growth in Silicon Steel.* W. E. Ruder. (56) Vol. 47.
Determination of the Position of Ae 3 in Carbon-Iron Alloys.* H. M. Howe and A. G. Levy. (56) Vol. 47.
The Critical Ranges A 2 and A 3 of Pure Iron.* G. K. Burgess and J. J. Crowe. (56) Vol. 47.
Assay of Gold and Silver by the Iron-Nail Method. E. J. Hall and C. W. Drury. (56) Vol. 47.
An Assay for Corundum by Mechanical Analysis. W. Spencer Hutchinson. (56) Vol. 47.
Ae 1, the Equilibrium Temperature for A 1 in Carbon Steel. Henry M. Howe. (56) Vol. 47.
Leaching a Zinc-Lime Ore with Acids.* O. C. Ralston and A. E. Gartside. (105) Mar.
Filling the Blast Furnace.* J. E. Johnson, Jr. (105) Serial beginning Mar.
Modern Cleveland Blast-Furnace Practice. R. Sharp. (Abstract of paper read before the Cleveland Institution of Engrs.) (22) Mar. 12; (47) Mar. 19.
The Smelting of Dross in the Electric Furnace. Raymond S. Wile. (Paper read before the Am. Electro-Chemical Soc.) (82) Mar. 13.
Areagrams of Open-Hearth Furnace Flues.* A. R. Mitchell. (20) Mar. 18.
Roll Pressure in Cold-Rolling Brass.* William K. Shepard and George C. Gerner. (72) Mar. 18.
Electromagnetic Ore Separation.* I. C. Clark. (16) Mar. 20.
Knight-Christensen Process at Provo, Utah.* Chas. F. Spaulding. (82) Mar. 20.
Zinc Pigments and the Leadville Works.* E. H. Leslie. (103) Mar. 20.
Magnetic-Concentration Mill at Mt. Hope, N. J.* Samuel Shapira. (16) Mar. 27.
The Formation and Decomposition of Sulphates During Roasting.* Boyd Dudley, Jr. (105) Apr.
Southern Ohio Blast Furnace Modernized.* (20) Apr. 1.
Alliages ayant des Propriétés Remarquables à Températures très Elevées ou à Températures très Basses.* Léon Guillet. (93) Sept.
Etude Physico-Chimiques sur l'Electrométallurgie de l'Aluminum.* Paul Pascal. (93) Oct.
Nouvelles Recherches sur les Alliages de Cuivre et de Zinc.* L. Guillet. (93) Oct.

Military.

The United States Engineer Corps in Times of War and Peace. Lansing H. Beach. (98) Jan.
Automatic Production of Shrapnel and Explosive Shell Parts.* (72) Mar. 4.
Hitting an Invisible Ship at a Ten-Mile Range.* (46) Mar. 6.

* Illustrated.

Military—(Continued).

Making the 18-lb. British Shrapnel.* John H. Van Deventer. (72) Serial beginning Mar. 25.
Photographing Projectiles.* C. Cranz, P. A. Günther, and F. Külp. (Translated for the *Journal* of the United States Artillery by Charles A. Junken.) (19) Serial beginning Mar. 27.

Mining.

Mining Costs Accounts of the Anaconda Copper Mining Co. H. T. Van Ells. (56) Vol. 46.
Use of Electricity in Mining in the Butte District.* John Gillie. (56) Vol. 46.
Timbering in the Butte Mines.* B. H. Dunshee. (56) Vol. 46.
The Compressed Air System of the Anaconda Copper Mining Co.* Bruno V. Nordberg. (56) Vol. 46.
The Southern Cross Mine, Georgetown, Mont.* Paul Billingsley. (56) Vol. 46.
Shaft-Sinking Methods of Butte.* Norman B. Braly. (56) Vol. 46.
Valuation of Coal Land. H. M. Chance. (56) Vol. 47.
The Use of the Microscope in Mining Engineering.* Frederick W. Apgar. (56) Vol. 47.
The Tin Situation in Bolivia.* Howland Bancroft. (56) Vol. 47.
The Substitution of Air for Water in Diamond Drilling. Ralph Wilcox. (56) Vol. 47.
Rock-Drilling Economics.* W. L. Saunders. (56) Vol. 47.
Method of Testing Draeger Oxygen Helmets at the Copper Queen Mine.* C. A. Mitke. (56) Vol. 47.
The Laws of Jointing.* Blamey Stevens. (56) Vol. 47.
High Explosives.* L. S. Marsh. (4) Feb.
A New Pit-Banking Arrangement at Sandwell Park Colliery.* J. L. Jeffrey. (57) Feb. 19.
E. E. White Coal Co. Mines.* George D. Evans. (45) Mar.
Concrete in Mine Work.* Sim. Reynolds. (45) Mar.
Central-Station Power in Coal-Mining Operations. Thomas Robson Hay. (9) Mar.
Use of Concrete Underground.* H. T. Mercer. (Paper read before the Lake Superior Min. Inst.) (45) Mar.
The Theory of the Arch in Mining.* Beverley S. Randolph. (45) Mar.
Mine-Ventilating Fan.* (11) Mar. 5.
Caving System at the Ohio Copper Mine.* F. Sommer Schmidt. (103) Mar. 6.
Steel Mine Tie Introduced by Cambria.* (62) Mar. 8.
Methods and Some Costs of Mine Shaft Sinking in Very Tough, Hard Rock. Wm. T. Westervelt. (Paper read before the Am. Assoc. for the Advancement of Science.) (86) Mar. 10.
Electricity Applied to Mining.* Charles P. Sparks. (77) Mar. 15.
Dawson, Nome, and Fairbanks.* Hubert I. Ellis. (16) Mar. 20.
A French Electric Mine Hoist.* (45) Apr.
Survey in Anthracite Mines.* William Z. Price. (45) Apr.

Miscellaneous.

The New International Diamond Carat of 200 Milligrams. George Frederick Kunz. (56) Vol. 47.
The Economies of a Manufacturing Plant. John Severin Branne. (Paper read before the Engrs.' Club of St. Louis.) (1) Feb.
Gyrostats and Their Lesson. (11) Feb. 19.
A Classification of High-Temperature Physical Problems. Edwin F. Northrup. (105) Mar.
Some Notes on Illumination.* V. H. Mackinney and E. Stroud. (Paper read before the Midland Assoc. of Gas Engrs. and Managers.) (66) Mar. 16.
Symposium on the Status of the Engineer. L. B. Stillwell and Others. (42) Apr.
The New Knowledge of Coal Tar. Horace C. Porter. (Paper read before the Dept. of Chem. Eng., Univ. of Pittsburgh.) (19) Apr. 3.
L'Exposition Internationale de San Francisco, Fevrier-Décembre 1915.* P. Calfas. (33) Feb. 20.
Ueber die Theorie der Schallfortpflanzung.* Richard Berger. (7) Sept. 5.

Municipal.

The Economic Side of City Planning.* Henry Wright. (Paper read before the Engrs.' Club of St. Louis.) (1) Feb.
Bituminous Road Construction.* (104) Feb. 26.
Methods and Cost of Constructing a Rolled Concrete Road in Washington.* Henry L. Bowlby. (From Report to the Washington Highway Comm.) (86) Mar. 3.
Studies in Road Construction. (Papers read before the County Road Engrs. and Superintendents of Ontario.) (96) Serial beginning Mar. 4.
Direction Posts.* (104) Mar. 5.

* Illustrated.

Municipal—(Continued).

Materials for Concrete Road Delivered by Industrial Cars from Central Plant.* (14) Mar. 6.
The Old National Road and Its Reconstruction.* C. H. Moorefield. (Paper read before the Ohio Eng. Soc.) (86) Mar. 10.
Hydrated Lime in Road Concrete. (13) Mar. 11.
The Chicago Plan and the New Heavy-Traffic Streets.* Walter D. Moody. (13) Mar. 11.
Device Tests Adhesiveness of California Road Oils.* (14) Mar. 13.
Grouting Boxes for Rubble Road Shoulders* (14) Mar. 13.
Methods and Mixtures Used in Constructing Tar Concrete Pavements.* Philip P. Sharples. (Paper read before the Am. Assoc. for the Advancement of Science.) (86) Mar. 17.
Cost Keeping and Accounting. W. Huber. (96) Serial beginning Mar. 18.
Estimating Cost. Hugh A. Lumsden. (96) Mar. 18.
Earth Road Construction and Maintenance. John H. Mullen. (96) Mar. 18.
Traffic and Modern Road Construction. R. C. Muir. (96) Mar. 18.
New York City Experience with Asphalt-Block Pavements.* Henry Welles Durham. (13) Mar. 18.
Economy in Highway Work, the Aim of Philadelphia's New Unit Cost System.* William H. Connell. (14) Mar. 20.
The Construction of Roads in Cities. Archibald Currie. (96) Mar. 25.
City Paving in Canada in 1914. (96) Mar. 25.
Concrete Materials Tested in a Jones-Talbot Rattler. (14) Mar. 27.
Testing Aggregates for Concrete Roads Built by the New York Highway Commission.* H. S. Mattimore. (Paper read before the Assoc. of Portland Cement Manufacturers.) (86) Mar. 31.
The Equipment and Maintenance of Convict Gangs in Georgia.* (86) Mar. 31.
Cost of Hauling Over Various Types of Roads. L. J. Smith. (96) Apr. 1.
Comparative Costs of Brick and Concrete Roads in Illinois. H. E. Bilger. (Paper read before the Illinois Soc. of Engrs. and Surveyors.) (13) Apr. 1; (86) Mar. 17.
Poor Sand the Cause of the Rapid Disintegration of a Sheet-Asphalt Pavement. Walter M. Cross. (13) Apr. 1.
Maintenance Cost System Used on U. S. Experimental Road.* E. W. James and C. S. Reeve. (14) Apr. 3.
Erfahrungen an neueren amerikanischen Betonstrassen.* Ernst Schick. (78) Serial beginning Mar. 3.

Railroads.

The Electrification of the Butte, Anaconda & Pacific Railway.* R. E. Wade. (56) Vol. 46.
Extensions of the Hudson River Tunnels of the Hudson and Manhattan Railroad Company. John Vipond Davies. (63) Vol. 197.
A Method of Setting Out the Transition Curve in which the Radius Varies Inversely as the Distance from the Origin.* Walter Hewson. (63) Vol. 197.
Rail Corrugation and its Causes. Stephen Prescott White D'Alte Sellon. (63) Vol. 197.
Rail-Steels for Electric Railways.* William Willox. (63) Vol. 197.
New Tank Locomotives, Great Central Railway Company.* (23) Jan. 1.
Steel Kitchen Cars for the East Coast Service.* (23) Jan. 1; (25) Apr.
Italian State Railways Standard Locomotives. E. L. Ahrons. (23) Jan. 8.
New Tank Locomotives, Taff Vale Railway Company.* (23) Jan. 15.
Economies in Freight Car Repairs. H. H. Harvey. (61) Jan. 19.
2-6-2 Type Tank Engine, Great Indian Peninsula Railway.* (23) Jan. 22.
Annual Cost of Locomotive Upkeep. (12) Feb. 19.
The Ikoma Tunnel, Japan.* (11) Feb. 19.
Tank Locomotives for the Gold Coast Railways.* (12) Feb. 26.
A Six-Cylinder Compound Locomotive, Erie Railroad.* (12) Feb. 26.
Heavy 4-4-0 Engines, Philadelphia and Reading Railroad.* (21) Mar.
Experiments to Determine the Stresses in Truck Side Frames. L. E. Endsley. (Paper read before the Ry. Club of Pittsburgh.) (25) Mar.
Conservation of Material in the Railroad Repair Shop. Ernest Cordeal. (9) Serial beginning Mar.
Portuguese Express Locomotive.* (25) Mar.
New Compound and Simple-Expansion Locomotives, Hungarian State Railways.* (21) Mar.
The Mechanical Elimination of Seams in Steel Products, Notably Steel Rails.* Robert W. Hunt. (55) Mar.
Steel Baggage and Mail Cars (Central Railroad of New Jersey).* (25) Mar.
Reciprocating and Revolving Parts. H. A. F. Campbell. (25) Serial beginning Mar.
Power Interlockings.* (21) Mar.
Building Gasoline Railway Cars and Locomotives.* (72) Mar. 4.

* Illustrated.

Railroads—(Continued).

Annual Charges for Railway Ties.* Harrington Emerson and T. T. Bowen. (Paper read before the Am. Wood Preservers' Assoc.) (96) Mar. 4.
The New Boston and Maine Shops at Billerica.* Fred H. Colvin. (72) Mar. 4.
Factors in Grade Separation. (14) Mar. 4.
Three-Centered Connecting Tracks between Tangents and Curves.* S. E. Shoup. (13) Mar. 4.
A Comprehensive Low Grade Trunk Line Development.* (23) Mar. 5.
Fuel and Tonnage Performance on the Seaboard.* L. G. Plant. (15) Mar. 5.
New Tank Locomotive, Great Eastern Railway.* (23) Mar. 5.
Some Maxima and Minima in Train Operation. Alfred Price. (Paper read before the Canadian Ry. Club.) (15) Mar. 5.
Some Results of Italian Three-Phase Electrifications.* G. Pontecorvo. (17) Mar. 6.
Motive Power Transformations, New York Central Lines.* (18) Mar. 6.
A Permanent Track Maintenance Force on the Long Island R. R. (13) Mar. 11.
New Railway Passenger Terminal at St. Paul, Minn.* (13) Mar. 11.
Lubricating Rails on Curves to Reduce Wear. (13) Mar. 11.
Track-Clearance Records.* James G. Wishart. (13) Mar. 11.
Clearing Interchange Yard for Chicago District.* (23) Mar. 12.
Factors Influencing Fuel Economy in Locomotives. M. C. M. Hatch. (Abstract of paper read before the New England R. R. Club.) (15) Mar. 12.
Fuel Oil Stations for Extreme Climatic Conditions: A Description of the Standard Layout Design on the Grand Trunk Pacific.* (15) Mar. 12.
Locomotives on the South African Railways.* (23) Mar. 12.
Lackawanna Locomotive with Water Tube Firebox.* (15) Mar. 12.
Hearings on Western Freight Rate Advances. (Before the Interstate Commerce Comm.) (15) Serial beginning Mar. 12.
Grade-Crossing Law and its Effect on Grade-Crossing Elimination. C. W. Stark. (14) Mar. 13.
Distribution of Vertical Soil Pressures; Tests at Engineering Experiment Station of Pennsylvania State College.* J. A. Moyer. (14) Mar. 13.
Valuation Conference in Washington, March 22. (14) Mar. 13.
Track Depression at Minneapolis.* (13) Mar. 18.
4-6-4 Tank Locomotive, Manila Railway.* (23) Mar. 19.
Grand Trunk Locomotives for Suburban Service.* (15) Mar. 19; (18) Mar. 27.
Canadian Pacific Terminal Improvements at Vancouver.* (15) Mar. 19; (18) Mar. 20.
Internal Transverse Cracks and Fissures in Rails.* Robert Job. (23) Mar. 19.
The Gresley Locomotive Superheater.* (23) Mar. 19.
The Operation of a Goods Shed.* T. E. Argile. (Paper read before the Midland Ry. Literary and Debating Soc.) (23) Serial beginning Mar. 19.
From A. C. to D. C. in the Night, Operation Without Interruption of Service, Unit Costs and Descriptions of Special Features (Annapolis Short Line).* (17) Mar. 20.
Some Results of B. A. & P. Railway Electrification. J. B. Cox. (Abstract from *General Electric Review.*) (16) Mar. 20.
Springfield Shops and Carhouses.* (17) Mar. 20.
Signal Maintenance Methods on the New York, Westchester & Boston Railway.* (17) Mar. 20.
Steel Cars on the Long Island.* (17) Mar. 20.
New Coast Line of Northern Pacific Ry. near Tacoma.* (13) Mar. 25.
The Railroads and the Public; a National Problem. Daniel Willard. (15) Mar. 26; (18) Mar. 27.
Erie 2-10-2 Type Locomotive.* (15) Mar. 26.
Rock Island Track Elevation Work at Chicago.* (15) Mar. 26.
Characteristics of Plate Springs.* George S. Chiles. (25) Serial beginning Apr.
Grand Trunk Suburban Coaches.* (25) Apr.; (15) Apr. 2.
Germany's Strategic Railways.* Victor Cambon. (From *La Nature.*) (9) Apr.
The Electrification of American Railways.* Reginald Gordon. (9) Apr.
The Defects of Modern Box Cars and Their Remedies. Robert N. Miller. (25) Apr.
New Railway Terminal at Denver, Colo.* (13) Apr. 1.
Molding Cast-Iron Tunnel Linings.* Louis J. Josten. (20) Apr. 1.
Contractor's Methods and Plant at the Kennerdell Tunnel of the Pennsylvania R. R. (13) Apr. 1.
New Line from Lewistown, Mont., to Great Falls.* (15) Apr. 2.
Le Chemin de Fer Electrique Monorail Aérien de Gênes (Italie).* (33) Feb. 27.
Percement du Tunnel de la Ligne Moutier-Granges (Suisse).* A. Bidault des Chaumes. (33) Mar. 6.
Vom Bau der Eisenbahn Chur-Arosa (Schweiz).* (51) Serial beginning Feb. 17.
Berechnung von Korbbögen bei Trassierung und Bau von Eisenbahnen.* H. v. Kager. (107) Feb. 20.

Railroads, Street.

Signaling on the Illinois Traction System.* John Leisenring. (17) Feb. 27.
Traffic Control at Electric Railway Crossings.* (60) Mar.

* Illustrated.

Railroads, Street—(Continued).

The New York Municipal Car, Motors, Control, Conduit and Collectors.* (17) Mar. 13.
Center Entrance Cars for Wilkes-Barre.* (17) Mar. 13.
Painting Cars in Two Days.* P. V. See. (17) Mar. 20.
The New York Municipal Car, the Lighting.* W. G. Gove. (Abstract of paper read before the Illuminating Eng. Soc.) (17) Mar. 27.
Detroit's Urban Transportation Needs, Present and Future Set Forth. (14) Apr. 3.
Les Tramways Electriques, d'Oran.* P. Caufourier. (33) Feb. 20.
Die Städtischen Strassenbahnen in Wien.* (41) Feb. 25.

Sanitation.

Report of Committee of the New England Water Works Assoc. (28) Dec.
Sewage Disposal Without Odor. Rudolph Hering. (60) Mar.
The West End Sewage-Treatment Works, Hamilton, Ont.* Bernard E. T. Ellis. (13) Mar. 4.
Garbage and Refuse Incinerator at Palo Alto, Calif.* Neil H. McKay. (13) Mar. 4.
Heating Equipment in Loomis Institute.* (101) Mar. 5.
English Experiments on Sewage Aeration Reviewed as Preliminary to Baltimore Tests.* Leslie C. Frank. (14) Mar. 6.
Constructing Pumping Station in Unbraced Cofferdam Formed by Outside Walls.* (14) Mar. 6.
The Sewage-Works of Marysville, Ohio.* (13) Mar. 11.
Sewage Disposal System for Private House.* Guy E. Watkins. (Paper read before the Municipal and County Health Officers of Arkansas.) (101) Mar. 12.
The Drainage of Hamilton, Bermuda.* G. Bertram Kershaw. (Paper read before the Inst. of San. Engrs.) (104) Mar. 12.
Method Employed in Placing a Neglected Sewage Treatment Plant in Successful Operation at Monticello, Arkansas.* Guy A. Watkins. (Paper read before the Arkansas Eng. Soc.) (86) Mar. 17.
Operations of the Cleveland Garbage-Reduction Works. (13) Mar. 18.
Little River Drainage District.* (13) Mar. 18.
New Public Comfort Station in Cincinnati.* (101) Mar. 19.
Features of Economical Church Heating Plant.* (101) Mar. 19.
Sewage Aeration at Lawrence and Manchester Compared. H. W. Clark. (14) Mar. 20.
Design, Cost and Operation of New Sewage Treatment Plant at the State Hospital, Warren, Pa. P. E. Mebus and F. R. Berlin. (86) Mar. 24.
A Garbage and Rubbish Incinerator Recommended for Albany, N. Y. (13) Mar. 25.
Plumbing and Heating in California Bungalow.* A. C. Shaver. (101) Mar. 26.
Collapsed Tunnel Shield at Memphis Rebuilt in Bad Ground.* C. H. Hollingsworth. (14) Mar. 27.
Sewage-Treatment Experiments with Aeration and Activated Sludge.* Edward Bartow and F. W. Mohlman. (Abstract of paper read before the Am. Chemical Soc.) (13) Apr. 1.
Plumbing and Heating in Burke Home.* (101) Apr. 2.
Three Districts for Disposal of Cleveland's Sewage. R. Winthrop Pratt. (14) Apr. 3.
Multiple Flow Chambers in Imhoff Tanks.* John H. Gregory. (14) Apr. 3.
Treat Illinois Sewage with Activated Sludge.* (14) Apr. 3.
Ueber Dimensionierung von Regenauslässen.* Alfr. Judt. (7) Aug. 8.
Allgemeine Regeln bezüglich Fabrikheizungen und Pumpenwarmwasserheizungen. Nelson S. Thompson. (7) Serial beginning Aug. 15.
Ueber "Verzögerung" in Regenwasserableitungen. Alfr. Judt. (7) Aug. 22.
Das Kühlerhalten der Amtsräume und Wohnungen bei warmer Sommerwitterung. H. Chr. Nussbaum. (7) Aug. 29.
Die Städtischen Brausebäder in Breslau.* W. Grunow. (7) Aug. 29.
Ueber Vereinheitlichung der Grundsätze bei Bearbeitung von Kanalisationsentwürfen. Alfred Judt. (7) Jan. 2.
Der Tunnel unter dem Kaiser-Wilhelm-Kanal für die Vollkanalisation der Stadt Kiel.* Feuchtinger und Platiel. (48) Serial beginning Mar. 13.

Structural.

The Great Falls Flue System and Chimney.* C. W. Goodale and J. H. Klepinger. (56) Vol. 46.
Shock Tests of Cast Steel.* John H. Hall. (56) Vol. 47.
The Strength of the Ideal Column.* Fitzroy Tozer Chapman. (63) Vol. 197.
The Connection Between the Elastic Phenomena Exhibited During Slow Reversals of Stress and the Ultimate Endurance of Steel.* William Charles Popplewell. (63) Vol. 197.
An Application of the Graphical Method of Deflections to Statically Indeterminate Frames.* Cecil Howard Lander and Robert Cotton. (63) Vol. 197.
Reinforced Concrete in the Edison Fire.* Percy H. Wilson. (2) Jan.

* Illustrated.

Structural—(Continued).

New Pennsylvania Elevator at Philadelphia.* (23) Jan. 15.
The Salem (Mass.) Conflagration, June 25, 1914.* (4) Feb.
Reinforced Concrete Column Formulæ.* Carl Gayler, Hans C. Toensfeldt, and Charles W. Martin. (Report of Committee of the Engrs'. Club of St. Louis.) (1) Feb.
Construction Management.* Sanford E. Thompson and William O. Lichtner. (4) Feb.
Calculations on Concrete. C. W. L. Alexander. (104) Feb. 19.
Lighting Fittings in Relation to Architecture and Decoration. F. W. Thorpe. (Paper read before the Illuminating Eng. Soc.) (66) Feb. 23.
Economy in Reinforced-Concrete Construction. T. A. Watson. (Abstract of paper read before the Concrete Inst.) (22) Feb. 26.
Paints to Prevent Electrolysis in Concrete Structures.* Henry A. Gardner. (3) Mar.
The Salem Fire.* F. A. McInnes and Clarence Goldsmith. (28) Mar.
Concrete Gas Tank Waterproofed with Hydrated Lime.* (67) Mar.
Concrete Chimneys.* (67) Mar.
Results of Some Tests to Determine the Effect of Normal and Low Temperatures on the Strength of Cement Mortar. (86) Mar. 3.
Lateral Strength of Hollow-Tile Walls; Tests at St. Louis.* (13) Mar. 4.
A Concreting Plant with a Braced Double Tower.* (13) Mar. 4.
Notes on Screens for Gravel Washing and Screening.* W. H. Wilms. (13) Mar. 4.
Facilitating Timber Design.* Sydney Diamant. (14) Mar. 6.
Concrete Warehouse on Brooklyn Waterfront Rapidly Completed Despite Serious Delays.* (14) Mar. 6.
Moving Reinforced-Concrete Hotel in San Francisco.* A. D. Phares. (14) Mar. 6.
Microscope Shows Importance of Mixing as a Factor in Making Strong Concrete.* Nathan C. Johnson. (14) Mar. 6.
Shrinkage Stresses and the Columns of the Edison Building.* (13) Mar. 11.
Reinforced Concrete Design.* David A. Molitor, M. Am. Soc. C. E. (96) Mar. 11.
Wind-Bracing Requirements in Municipal Building Codes. R. Fleming. (13) Mar. 11.
Some Notes on Wind Pressure. R. Graham Keevil. (Abstract of paper read before the Concrete Inst.) (104) Mar. 12.
Concrete a Plague Eradicator in New Orleans. H. P. Letton. (14) Mar. 13.
Concrete Posts and Poles. Geo. E. Boyd. (Paper read before the Am. Ry. Bridge and Bldg. Assoc.) (18) Mar. 13.
High-Strength Concrete Produced Through Lowering of Surface Tension of Mixing Water.* Nathan C. Johnson. (14) Mar. 13.
Dry Rot in Factory Timber. (14) Mar. 13.
The Concrete Pile Holder Foundation at Lynn.* Francis E. Drake. (Paper read before the New England Assoc. of Gas Engrs.) (24) Mar. 15.
Burned Clay *vs.* Lumber. Gardner Read and E. Winfield Day. (76) Mar. 16.
A Graphical Method for Designing Simple Reinforced Concrete Beams and Data for Designing Simple Double-Reinforced and T-Beams.* Ralph R. Leffler. (86) Mar. 17.
American Concrete Institute's Tests on Concrete Columns.* (13) Mar. 18.
Coal Slack for Concrete Aggregate. R. B. Ketchum. (13) Mar. 18.
Features of a Large Winter Concreting Job.* (13) Mar. 18.
Tie-Rods for Floor Arches; a Criticism of Current Practice.* Frank N. Kneas. (13) Mar. 18.
The Effects of Heat and of Work on the Mechanical Properties of Metals.* A. K. Huntington. (Paper read before the Inst. of Metals.) (11) Mar. 19.
Waste of Metal in Mill-Building Columns.* C. L. Christensen. (13) Mar. 25.
Floating a Clubhouse to a New Site.* (13) Mar. 25.
Prevention of Dry Rot in Mill Buildings; Examination for the Presence of Fungus, Characteristics of Growth and Effects of Variations in Humidity.* (14) Mar. 27.
New Concrete Warehouses and Terminal Plant at New Orleans will Cover 100 Acres; Devices for Handling Cotton in Piers.* (14) Mar. 27.
Rapid Construction of Additions to Steel Buildings; Wide Column Spacing and Unusual Maple Flooring Used.* Herbert E. Mitler. (14) Mar. 27.
Equipment and Methods Used in Constructing the Austin Nichols Building in New York.* (86) Mar. 31.
The Preservation of Mine Timber. H. A. Appel. (Abstract of paper read before the Engrs'. Soc. of Northeastern Pennsylvania.) (45) Apr.
Repeated Stress Tests of Steel.* J. B. Kommers. (72) Apr. 1.
Foundations for Schenectady Gas Holder.* (83) Apr. 1.
Hollow-Tile Partitions and Floor Arches Tested.* (14) Apr. 3.
Aeroscope, a Novel Feature of Panama-Pacific Exposition.* (14) Apr. 3.
Recherches sur la Fragilité; l'Eclatement. Ch. de Fréminville. (93) Sept.
Note sur la Détermination Rationelle des Pièces en Béton Armé. G. Espitallier. (33) Serial beginning Mar. 13.

* Illustrated.

Structural—(Continued).

Ermittelung der Abmessungen einfach und doppelt bewehrter Eisenbeton-Querschnitte bei reiner Biegung sowie bei exzentrischem Druck und Zug. W. Stark. (51) Sup. No. 4.
Neuere amerikanische Versuche über den Gleitwiderstand einbetonierten Eisen. (51) Serial beginning Sup. No. 4.
Eisenbeton-Konstruktionen der Ferkelhalle zu Husum.* H. F. Kühl. (51) Sup. No. 5.
Die städtische Schlacht-und Viehhofanlage Erfurt. A. Stein. (7) Jan. 2.
Erfahrungen mit Eisenbetonschornsteinen. Ernst Schick. (80) Serial beginning Jan. 3.
Das Gefrierverfahren.* Rogge. (40) Jan. 6.
Ueber das Ausbeulen von Kreisförmigen Platten. A. Nádai. (48) Serial beginning Feb. 27.
Neuere amerikanische Versuche zur Bestimmung der Haftfestigkeit zwischen Beton und Eisen.* (78) Serial beginning Mar. 3.
Der Abbruch und die Zerstörung von Beton-und Eisenbetonbauten mittels Sprengstoffe.* P. W. Scharroo. (78) Serial beginning Mar. 3.
Kontor-und Industriehaus der Verlagsgesellschaft deutscher Konsumvereine m. b. H., Hamburg, Strohhaus 38 40.* (78) Mar. 3.
Ueber die Berechnung freitragender Wellblechdächer.* Siegmund Müller. (50) Mar. 11; (48) Mar. 13.
Deutsche Wellblech-Normalprofile aufgestellt vom Verein deutscher Eisenhüttenleute.* (48) Mar. 13.

Topographical.

Applied Geology in the Butte Mines.* Frank A. Linforth. (56) Vol. 46.
Topographic Maps for the Mining Engineer.* E. G. Woodruff. (56) Vol. 47.
The Topographic Map of Pennsylvania. Richard R. Hice. (98) Mar.
Some History of the Stadia Method of Surveying.* (13) Mar. 11.
A Method of Obtaining Volumes in Railroad or Ditch Work by Diagrams.* F. C. Snow. (86) Mar. 31.

Water Supply.

Hydro-Electric Development in Montana.* Max Hebgen. (56) Vol. 46.
The Diaphragm Method of Measuring the Velocity of Fluid-Flow in Pipes.* Holbrook Gaskell. (63) Vol. 197.
The Stability of Weir Foundations on Sand and Soil Subject to Hydrostatic Pressure.* William Maurice Griffith. (63) Vol. 197.
Steel Forms for Reinforced-Concrete Conduit, Catskill Aqueduct, New York.* William Franklin Dennis. (63) Vol. 197.
Water Uses Difficult to Control.* William F. Sullivan. (28) Dec.
Public Watering Stations.* Frank E. Merrill. (28) Dec.
Developments in Water Softening.* (22) Jan. 15.
Water Power and Its Relation to Irrigation in Southern Idaho.* John C. Beebe. (Paper read before the Montana Soc. of Engrs.) (1) Feb.
Pumping Engines, Madras Waterworks.* (12) Feb. 19.
Gardner's Integrating and Recording Weir-Meter.* (11) Feb. 19.
Cost of Pumping for Irrigation.* Barry Dibble. (Paper read before the Idaho Soc. of Engrs.) (111) Feb. 27.
Damages for Loss of Water Power. F. W. Dean. (55) Mar.
Procedure in the Investigation of a Proposed Water Power Development.* Earl J. Atkisson. (100) Mar.
Multistage Centrifugal Pumps.* (45) Mar.
Metering an Old City. James A. McMurray. (28) Mar.
Electrolysis and Its Mitigation. (An Account of Destructive Effect on Pipes.) E. B. Rosa. (28) Mar.
Rates for Water Supply. B. M. Wagner. (28) Mar.
A Rate-Flow Meter.* H. C. Hayes. (55) Mar.
The Purification of Boiler Feed Water.* Everard Brown. (105) Mar.
Laboratory for Investigating and Testing Liquid Flow Meters of Large Capacity.* W. S. Giele. (55) Mar.
The Use of Ozone as a Sterilizing Agent for Water Purification. S. T. Powell. (28) Mar.
The Results of Meterage at Columbus, Ohio, with Special Reference to Restriction of Waste in Lawn Sprinkling. Jerry O'Shaughnessy. (Paper read before the Indiana San. and Water Supply Assoc.) (86) Mar. 3.
Liquid Chlorine Sterilization of the Water Supply of St. Catharines, Ontario.* Alexander Milne. (86) Mar. 3.
Redevelopment of Old Canal Power at Cohoes Falls, N. Y.* (13) Mar. 4.
An Electric Well-Sounding Instrument.* Leslie W. Stocker. (13) Mar. 4.
A New Mechanical Filter.* (12) Mar. 5.
The Business Engineering Problem in Water Power Development with the Solution for a Specific Case. W. V. N. Powelson. (Paper read before the Am. Assoc. for the Advancement of Science.) (86) Mar. 10.

* Illustrated.

Water Supply—(Continued).

Data and Discussion on Pollution of Public Water Supplies Through Connections to Industrial Supplies. L. H. Van Buskirk. (Paper read before the Ohio State Board of Health.) (86) Mar. 10.

Method and Cost of Constructing a 6-Mile Water Main, of 3-Inch Screwed Pipe, for New Orleans Lake Shore Land Co. Arthur M. Shaw. (86) Mar. 10.

Plant and Methods Employed in Laying the Flexible-Jointed Narrows Syphon of the Catskill Aqueduct.* Stephen W. Symons. (86) Mar. 10.

The Salmon Creek Dam; a Constant-Angle Arch Type.* (13) Mar. 11.

Records of Service of Cast-Iron Water Pipe.* (13) Mar. 11.

Cutoff-Wall and Rock Grouting at the Milton Reservoir Embankment.* (13) Mar. 11.

Bradford Waterworks.* (12) Serial beginning Mar. 12.

Liquid Chlorine Reduces Cost at Bubbly Creek Filters. C. A. Jennings. (Abstract of paper read before the Am. Water Works Assoc.) (14) Mar. 13; (13) Mar. 18.

Progress in Kansas in Pumping for Irrigation. H. B. Walker. (Paper read before the Kansas Eng. Soc.) (86) Mar. 17.

The Proper Installation of Air Lift Pumps.* A. H. Ford. (Paper read before the Iowa Eng. Soc.) (86) Mar. 17.

Measuring Devices for Irrigation Water Tested at the Davis Field Laboratory, University of California.* (From *Bulletin No. 247*, Agri. Exper. Station, Univ. of California.) (86) Mar. 17.

Design and Construction of the New Standpipe of the Youngstown, Ohio, Water Works.* N. E. Hawkins. (86) Mar. 17.

Ontario Water Supply and Sewerage Legislation. F. A. Dallyn. (96) Mar. 18.

Birmingham Water-Rate Agreement. (13) Mar. 18.

Reconstruction of the Austin, Texas, Dam.* (13) Mar. 18.

A Large Water Softener.* (22) Mar. 19.

Central Hydro-Electric Plant of 50 000 Horsepower Replaces Inefficient Separate Units at Cohoes.* A. G. Hillberg. (14) Serial beginning Mar. 20.

Collapsible Hypo Plant Packed in a Trunk.* (14) Mar. 20.

Concrete Surge Tank, Disconnected at Base, Operates on Differential Principle.* (14) Mar. 20.

Economic Considerations Justify Wood-Stave Pipe for Water-Power Penstocks; Comparison with Steel in Respect to Cost, Durability and Carrying Capacity. Robert E. Horton. (14) Mar. 20.

Salt Solution Test Shows Turbine Efficiency of 93 Per Cent. at Holtwood Plant; Chemical or Titration Method Employed Successfully at Low Cost on New 16 500-Horsepower Single-Runner Wheel.* (14) Mar. 20.

Practical Procedure in Designing Penstocks.* Vincent P. Marran. (14) Mar. 20.

One Governor Controls Two Waterwheels.* (14) Mar. 20.

New Flume Needed for Waterwheel Tests. (14) Mar. 20.

Ten Per Cent. Efficiency Increase Follows Change from Double- to Single-Runner Turbine; New Type of Unit Added to Holtwood Plant Requires Rebuilding of Substructure, but will Reduce Maintenance Costs.* (14) Mar. 20.

Tests Check Computed Value of Surges.* (14) Mar. 20.

Tail-Tunnel Regulation Suggests New Opportunities in Hydroelectric Field. R. D. Johnson. (14) Mar. 20.

Method of Relining a Small Bricklined Water-Works Reservoir with Asphalt and Concrete at Irwin, Pa.* John M. Rice. (86) Mar. 24.

Methods and Apparatus Employed in Carrying on Continuous Water Waste Surveys in the District of Columbia.* Paul Lanham. (Paper read before the Indiana San. and Water Supply Assoc.) (86) Mar. 24.

Two Types of Joint Between Walls and Bottom of a Reservoir.* (13) Mar. 25.

Placing a Jointed Concrete Pressure Pipe Inside a Brick Tunnel.* (13) Mar. 25.

Philadelphia Water-Filter Operations in 1914. (13) Mar. 25.

New High-Service Reservoir, Halifax, N. S.* Thos. W. J. Lynch. (96) Mar. 25.

Construction Methods at Cedars Development.* (13) Mar. 25.

Cedars Hydro-Electric Development, St. Lawrence River.* (13) Mar. 25.

Kinks in the Control of Hypochlorite.* (14) Mar. 27.

Guys Steady High Steel Tower During Moving. C. E. Henderson. (14) Mar. 27.

Design and Cost of Concrete Posts Used Along Catskill Aqueduct.* (86) Mar. 31.

The Turbines of the Cedars Hydro-Electric Plant.* (13) Apr. 1.

Quincy Coagulating Basins Operate Best in Series. (14) Apr. 3.

Les Usines de Capdella et de Barcelone de la Société "Energia Electrica de Cataluña".* (33) Mar. 13.

Die Ozonisierung des Pregelwassers in Königsberg i. Pr.* (112) Serial beginning Jan. 1.

Die Bedeutung des Saughebers für die Wasserversorgungstechnik. N. Schiemann. (112) Jan. 1.

Die Wasserversorgung von Kopenhagen.* Sverre Malm. (112) Serial beginning Jan. 1.

Bremsergebnisse an der 9 700 P. S. Hochdruck-Francisturbine der Anlage in Centerville der Pacific Gas & Electric Co., San Francisco, nach vierjährigem, ununterbrochenem Betriebe.* Arnold Pfau. (107) Feb. 13.

---

* Illustrated.

Water Supply—(Continued).

Pumpwerk der Wasserversorgung Balgach.* A. Sonderegger. (107) Feb. 13.
Der Tenango-Damm des Wasserkraftwerks Necaxa in Mexiko.* W. Hugentobler. (107) Serial beginning Feb. 27.
Einfache Formeln und Kurventafeln zur Berechnung zylindrischer Behälterwände mit rechteckigem, dreieckigem oder trapezförmigem Wandschnitt. V. Lewe. (78) Mar. 3.
Die Erweiterung des Wasserwerks der Stadt Magdeburg.* E. Fischer. (78) Serial beginning Mar. 3.

Waterways.

The New Harbour-Works and Dockyard at Gibraltar.* Adam Scott. (63) Vol. 197.
The Formation of Standing Waves in an Open Stream.* Arnold Hartley Gibson. (63) Vol. 197.
Floating Concrete Caissons. (Foreign and Domestic Development.)* Harrison S. Taft and O. D. Jones. (100) Mar.
Excess Head in the Operation of Large Locks Through the Momentum of the Column of Water in the Culverts.* George B. Pillsbury. (100) Mar.
The Effect of Levees on the Flow of Sediment in Rivers.* C. McD. Townsend. (100) Mar.
Pipe Line Dredges. E. J. Dent, M. Am. Soc. C. E. (100) Mar.
The Illinois Waterway, Proposed Eight-Foot Channel from Lockport to Utica.* (86) Mar. 3.
Construction of the Barge Canal Crossing of Oak Orchard Creek.* Emile Low. (13) Mar. 4.
Electrical Haulage on the Trent and Mersey Canal.* (57) Mar. 5.
New Type of Gate for Regulating Adjacent Water Levels Operates Automatically.* (14) Mar. 6.
Port Development at Seattle.* Paul P. Whitham. (13) Mar. 11.
Dredging "Sudd" on the River Nile.* (13) Mar. 18.
Culverts. R. M. Smith. (96) Mar. 25.
Pile Penetration With and Without Water Jet.* F. Y. Parker. (13) Mar. 25.
The U. S. Lighthouse Service.* George R. Putnam. (13) Apr. 1.
Dumping-Bridge for Building an Embankment in Tidal Water.* (13) Apr. 1.
Concrete "Bleachers" Protect Massachusetts Shores.* (14) Apr. 3.
Panama Canal in Miniature Operates at Exposition.* (14) Apr. 3.
Drag-Line Excavators with High-Duty Machinery.* (14) Apr. 3.
Ueber das Vollaufen der Kanäle. Armin Schoklitsch. (53) Feb. 19.

* Illustrated.